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March 4, 2005

AF/3713
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MAIL STOP APPEAL BRIEF- PATENTS

Commissioner for Patents
P.O. Box 1450
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NUMBER: EV 284718350 US
DATE: March 4, 2005

I hereby certify that this correspondence is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313.

Deborah Ricks
Signature

Re: Applicant(s): Francisco Jose Paz Barahona
Timothy C. Loose
Serial No. 10/026,579
Filing Date: December 19, 2001
For: Gaming Machine With Ambient Noise Attenuation
Docket No.: 47079-00124USPT

Dear Sir:

Transmitted for filing with the Patent and Trademark Office are the following documents for the above-referenced patent application:

1. Supplemental Appeal Brief Pursuant to 37 C.F.R. § 1.193(b)(2) with attached Appendices J through Q (in triplicate);
2. Transmittal Letter (in triplicate); and
3. Acknowledgement Postcard.

In the event there is an under or overpayment, please debit or credit our Deposit Account #10-0447 (47079-00124USPT). This letter is being filed in triplicate to facilitate processing.

Date: March 4, 2005

Respectfully submitted,

Sorinel Cimpoes

Sorinel Cimpoes
Registration No. 48,311



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/026,579
Applicants : Francisco Jose Paz Barahona
Timothy C. Loose
Filed : December 19, 2001
Title : GAMING MACHINE WITH AMBIENT NOISE
ATTENUATION
TC/A.U. : 3713
Examiner : John M. Hotaling
Docket No. : 47079-000124USPT

SUPPLEMENTAL APPEAL BRIEF PURSUANT TO 37 C.F.R. § 1.193(b)(2)

Mail Stop Appeal Brief—Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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Signature

Dear Commissioner:

After the Applicants filed the Appeal Brief on February 23, 2004, prosecution has been reopened and a new ground of rejection was entered in an Office Action dated May 5, 2004. After the Applicants responded to the Office Action, in a Response dated July 15, 2004, a Final Office Action was entered on December 9, 2004. In accordance with 37 C.F.R. § 1.193(b)(2)(ii), the Applicants request reinstatement of the Applicants' appeal to the Board of Patent Appeals and Interferences from the rejection of claims 14-23 and 25-29, and file this Supplemental Appeal Brief in support of the request. The due date for the Supplemental Appeal Brief is March 9, 2005.

The Applicants incorporate by reference sections 1-7 of the original Appeal Brief. Thus, the previously-raised issue is still considered to be relevant.

8. ARGUMENT

The Applicants incorporate by reference the Argument section of the original Appeal Brief. Thus, all the previously-raised arguments are still considered to be relevant. For example, the previously-raised arguments include:

- the argument that the Examiner has misconstrued Brune and its teachings regarding desktop and laptop computers;
- the argument that the active noise reduction (ANR) of Eatwell focuses the antinoise signal at the microphone to create a quiet zone at the microphone – not at the user of the personal computer;
- the argument that Cain cannot be combined with Eatwell because there is no suggestion for combining Cain's headrest system with Eatwell's personal computer; and
- the argument that the cited references do not teach all of the claim limitations – a gaming machine for broadcasting to the player (i) game sounds coordinated with the displayed representation and (ii) anti-noise sounds so as to enhance the game sounds.

Each of these four arguments, by itself, would overcome the previous three-reference obviousness rejection and the current four-reference obviousness rejection. Furthermore, the addition of the fourth reference to this combination presents yet another (*i.e.*, a fifth) substantial argument to overcome the Examiner's new ground of rejection.

In an Office Action, dated May 5, 2004, the Examiner has acknowledged the receipt of the appeal filed on February 23, 2004, and has withdrawn the final rejection in view of newly discovered art. Office Action of May 5, 2004 ("New Office Action"), attached as Appendix J. In the New Office Action, the Examiner simply added a new fourth reference to the previously used three-reference obviousness rejection that the Applicants disputed in the Appeal Brief. The Examiner did not respond to any of the Applicants' arguments, simply stating that "Applicant's arguments with respect to claims 14-23 and 25-29 have been considered but are moot in view of

the new ground(s) of rejection.” *Id.* at p. 4. The Applicants consider the New Office Action to be an unfair response because the fundamental arguments in the original Appeal Brief regarding why the three-reference combination must fail were never discussed. These previously submitted arguments were (and are) still applicable.

To put a quick end to the issue, the Applicants chose to file a response addressing the new ground of rejection (rather than reinstate the Appeal at that time), and noted that the New Office Action had not addressed any of the Applicants’ previous arguments. Response To Office Action Dated May 5, 2004, attached as Appendix K. In a Final Office Action, the Examiner reiterated the position taken in the New Office Action. Final Office Action Dated December 9, 2004, attached as Appendix L.

I. The Newly Added Reference Does Not Teach The Reduction Of Ambient Noise In A Gaming Establishment

The new ground of rejection simply consists of the addition of a fourth reference, JP 10-277213A (“Heiwa”), to the combination of Brune, Eatwell, and Cain, which was previously used to reject the claims. Accordingly, claims 14-23 and 25-29 are now rejected under 35 U.S.C. § 103(a) as being unpatentable over Brune in view of Eatwell in view of Cain and further in view of Heiwa. Regarding Heiwa, the following documents have been included: an English abstract of Heiwa provided by the Japanese Patent Office website (two pages) (“JPO Abstract”), attached as Appendix M; a mechanical English translation of the Heiwa claims provided by the Japanese Patent Office website (two pages), attached as Appendix N; a mechanical English translation of the Heiwa specification provided by the Japanese Patent Office website (twenty-two pages), attached as Appendix O; a Japanese copy of Heiwa (thirty-one pages), attached as Appendix P; and an alternative English abstract of Heiwa provided by Thomson Derwent (one page), attached as Appendix Q.

Specifically, in the Final Office Action the Examiner has made the following allegation:

Heiwa teaches that pachinko game machines can have built in noise reduction units to reduce the noise from the game machines. The system facilitates noise reduction in response to predetermined conditions from the exterior of the game machine. Thus, Heiwa provides further evidence that it was known in the art at the time of the invention to reduce ambient noise in gaming halls though [sic, through] the use of the noise reduction systems.

Appendix L, p. 3 (emphasis added).

The inclusion of Heiwa, in fact, only bolsters the Applicants' position. The problem sought to be solved by Heiwa is related to allowing a player to hear messages broadcasted through a gaming establishment's public address system ("p.a. system"). Appendix M. For example, Heiwa notes that the goal of the invention is to "make sound easier to hear, when transmission in a game parlor or back ground music is output using conventional transmission equipment," if a specified condition is satisfied. *Id.* Heiwa describes a specified condition being, for example, a worker that switches a microphone 12 to an ON position and, then, raises a volume knob 13 of the microphone 12 to a preset volume level for playing background music (e.g., music for closing time) over the p.a. system. According to Heiwa, the background music "takes precedence over playing sound of pachinko machines." *Id.* In other words, the sounds of a pachinko machine are replaced by the sounds of the p.a. system.

Thus, the system disclosed by Heiwa is a game-establishment sound system that overrides sounds produced by a particular pachinko machine. In contrast, the current invention is directed generally to a gaming-machine sound system that, to an extent, overrides ambient noise sounds (e.g., sounds produced by a p.a. system). Heiwa discloses a system plagued with one of the exact type of problems that the present invention seeks to eliminate.

Based on the Examiner's allegations, although not clear, it seems that the use of Heiwa is directed to rebutting the following statement made by the Applicants in the Appeal Brief:

Furthermore, none of the references mentions anything about ambient noise in a gaming establishment, much less that ambient noise in gaming establishment is a problem

Appeal Brief, p. 7. If the "problem" solved by the present invention had been a player's ability to hear information transmitted over an establishment's p.a. system, then the reduction of noise taught by Heiwa might have been relevant. However, the "problem addressed by the Applicants is to provide a gaming machine that enhances its game sounds by minimizing interference from ambient noise produced by the surrounding environment." *Id.* at pp. 8-9 (emphasis added).

The Heiwa system does the opposite of the claimed system. While the Heiwa system is directed to shutting-down the sounds from a game machine, the system of the present invention is directed to enhancing the sounds from the game machine. Thus, in contrast to the system of

the present invention, the Heiwa system increases ambient noise by shutting-down, or reducing, the sounds of a particular game machine.

In short, the new position for rejecting the claims combines four different references, one of which, Heiwa, teaches the skilled artisan to do exactly the opposite of the present invention. If anything, Heiwa provides further support for the non-obviousness of the present invention by advocating and emphasizing one type of problem that the present invention seeks to solve. *See, e.g., In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983) (stating that it is improper to combine references where the references teach away from their combination); and Manual Of Patent Examining Procedure, Eighth Edition, Incorporating Revision No. 1, February 2003, § 2145 (X)(D)(1), page 2100-162 (stating that a “prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness”).

II. The Newly Added Reference Does Not Teach The Enhancing Of Game Sounds

In an apparent attempt to further support his reasoning, the Examiner quotes the following two paragraphs from the Heiwa specification:

[0033] Furthermore, invention of claim 10 constitutes a game machine including a modification means to change the loudness level of sound of the game sound outputted by output means to output a game sound according to a game condition, sound-volume judging means to judge the loudness level of sound of alien frequencies, and said output means into the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by said sound-volume judging means

[0061] Moreover, when carrying out [sound/game] noise reduction by the demand I from the hole computer 10

Appendix O, pp. 5-6, 9. The citation is followed by the Examiner’s own interpretation of the cited text, noting that the “examiner reads this statement to mean that the game sounds can be enhanced or lowered depending on the desires of the game operator.” Appendix L, p. 4 (emphasis added).

Just like the overall rejection is based on taking selective bits and pieces from a string of prior art references without considering their teachings as a whole, the Examiner is now selectively quoting bits and pieces from the specification of Heiwa, without considering the

teachings of Heiwa as a whole. The Examiner concludes, without any substantive support, that the phrase “change the loudness level of sound of the game sound” means the same thing as “enhancing” the game sounds. *Id.* While the Examiner “reads this statement to mean that the game sounds can be enhanced,” the specification of Heiwa contradicts the Examiner’s interpretation. *Id.*

The text cited by the Examiner does not mention anywhere anything about “enhancing” any game sounds. The text cited by the Examiner merely describes a change of game sounds. Instead of searching for the definition of the term “change” by analyzing the Heiwa specification as a whole, the Examiner has apparently substituted his own definition.

A proper analysis of Heiwa shows that it does not teach anything about “enhancing” game sounds. In fact, Heiwa teaches the exact opposite. As described in the above section, the game sounds of the gaming machines of Heiwa are reduced to allow a player to hear messages or music broadcasted over the p.a. system. When Heiwa describes the change in the game sounds, it always describes the game sounds as being reduced or turned off.

For example, if broadcasting of a message does not occur, then the game sounds are not reduced:

[0142] . . . That is, the usual attenuator data set at first are held, and the sound-volume attenuation level of a game sound is set to 0dB. When you have no broadcast, naturally it is because it is not necessary to make sound volume of a game sound small.

Appendix O, p. 17 (emphasis added). When a particular type of audio output is being transmitted over the p.a. system, such as background music, then the game sounds are reduced:

[0143] Moreover, when the game sound precedence BGM is being passed, the hole computer 10 sends out a demand command (“H” H”, “L”). . . . Since priority is given to some extent to a game sound, the magnitude of attenuation of the sound volume of a game sound is stopped small.”

Id. (emphasis added). In another example, Heiwa teaches that the game sounds are “muffled”:

[0147] Moreover, when broadcasting the advice of the close of this pachinko machine, the hole computer 10 sends out a demand command (“L” H”, “L”). The pachinko machine which received

this command adds 15 to the usual attenuator data as sound-volume attenuation data. At this time, it is muffled [sound / game] thoroughly (OFF). It is because it is necessary to tell a game visitor so that there may be no failure in hearing of advice of the close.”

Id. (emphasis added). The above citation reinforces the goal of the Heiwa invention, which is to allow a player of the gaming machine to hear information broadcasted over the p.a. system. In a further example, Heiwa clarifies that the ambient noise of the gaming establishment is not a factor in changing the level of the game sounds:

[0158] As drawing 20 and drawing 21 show, the pachinko machine 24 concerning the gestalt of the 4th operation is equipped with the sound-collecting microphone 141 which detects an acoustic wave and is changed into an electrical signal. In addition, it is more desirable to use a directive high thing so that this sound-collecting microphone 141 may not catch a surrounding sound as much as possible but only the announcement over a store’s public address system and BGM from a loudspeaker 22 may be detected.

Id. (emphasis added). It is the objective of Heiwa to change, *i.e.*, reduce, the level of the game sounds based only on audio information transmitted via the p.a. system.

Thus, the meaning of the term “change,” based on the specification of Heiwa, has nothing to do with enhancing game sounds. Heiwa specifically describes the game sounds as being reduced or turned off, based on audio information transmitted via the p.a. system, to allow a player to hear the audio information. Accordingly, Heiwa fails to address the arguments presented by the Applicants in the original Appeal Brief.

III. The Examiner Has Failed To Address And/Or Has Mischaracterized The Applicants’ Arguments

Reliance on Heiwa has nothing to do with the Applicants’ arguments that “the Examiner has misconstrued Brune and its teachings regarding desktop and laptop computers,” that “the Active Noise Reduction (ANR) of Eatwell focuses the antinoise signal at the microphone to create a quiet zone at the microphone – not at the user of the personal computer,” that “Cain cannot be combined with Eatwell because there is no suggestion for combining Cain’s headrest system with Eatwell’s personal computer,” and that “the cited references do not teach all of the

claim limitations – a gaming machine for broadcasting to the player (i) game sounds coordinated with the displayed representation and (ii) anti-noise sounds so as to enhance the game sounds.”

The Examiner’s cursory note regarding the Applicants’ arguments does not provide any substantive support for the Examiner’s rejection of the claims of the present invention. For example, the Examiner alleges that “[r]educing ambient noise from a gaming hall while not specifically stated can be inferred from a reading of the above references.” Appendix L, p. 6. Besides noting that one can infer a reduction of ambient noise in a gaming hall by reading the above references, the Examiner provides no substantive support. There are no quotes or citations showing the basis for the Examiner’s allegation. In fact, as discussed above, the references teach away from the Examiner’s alleged inference (*e.g.*, Heiwa teaches that ambient noise of the system is increased).

In addition, the Examiner notes that “[i]n response to applicant’s argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention.” Appendix L, p. 6. The Examiner supports this note with a decision of the Federal Circuit Court of Appeals. *In re Gorman*, 933 F.2d 982, 18 U.S.P.Q. 2d 1885 (Fed. Cir. 1991). However, nowhere in the Response to the New Office Action did the Applicants make an argument that the Examiner has used an excessive number of references. *See e.g.*, Appendix K. As described above, the problem with the Examiner’s arguments does not lie in the number of references but in the hindsight reconstruction of the references. As the Federal Circuit clearly stated, “[i]t is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant’s structure as a template and selecting elements from references to fill the gaps.” *In re Gorman*, 933 F.2d at 987.

9. CONCLUSION


For at least the foregoing reasons, the rejection of all the appealed claims -- claims 14-23 and 25-29 -- set forth in the Final Office Action dated December 9, 2004 should be reversed.

In accordance with 37 C.F.R. § 1.192(a), the Applicants are submitting this supplemental brief in triplicate. It is the Applicants’ belief that no fees are due at this time. However, the Commissioner is authorized to charge any additional fees inadvertently omitted that may be

required (except the issue fee) now or during the pendency of this application to JENKENS & GILCHRIST, P.C. Deposit Account No. 10-0447(47079-00124USPT).

Respectfully submitted,

Date: March 4, 2005



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/026,579

12/19/2001

Francisco Jose Paz Barahona

47079-0124

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05/05/2004

Michael J. Blankstein
WMS Gaming Inc.
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Waukegan, IL 60085

EXAMINER

ENATSKY, AARON L

ART UNIT

PAPER NUMBER

3713

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

DOCKETED
Action Due: <u>Response NF</u>
Due Date: <u>8/5/04</u>
Final Date: <u>11/5/04</u>

Office Action Summary

Application No.

10/026,579

Applicant(s)

BARAHONA ET AL.

Examiner

Aaron L. Enatsky

Art Unit

3713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-23 and 25-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-23 and 25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

Examiner acknowledges receipt of appeal on 2/23/04. Examiner has withdrawn the final rejection in view of newly discovered art. A detailed rejection is described below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14-23, and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over by US Patent No. 5,851,148 to Brune et al. ("Brune") in view of US Patent No. 5,828,768 to Eatwell et al. ("Eatwell") in view of US Patent No. 5,133,017 to Cain et al. ("Cain") in view of JP 10-277213A to Heiwa.

In re claims 14, 20, and 26-29, Brune teaches a standard gaming machine that has elements of wagering, credit accepting and output mechanisms, bonus meters, and random outcome selection (1:1-2:67) all of which are well known in the gaming arts. Brune also teaches the devices that are used for gaming machines typically are computers, of which can be a desktop or laptop personal computers (5:25-48). Brune however, does not teach aspects of noise cancellation as claimed in the instant application. Eatwell teaches integration of speakers and microphones into a personal computer to form a novel multi-media computer that contains noise cancellation electronics (Abstract). The noise cancellation suits an array of other electronics including a multimedia PC, video monitor, television, laptop computer, etc., which from the

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above types, would include gaming machines. The active noise cancellation circuit (ANR) in a multimedia PC detects ambient or unwanted noise and produces a cancellation sound wave through the PC speakers (6:54-7:19). One would be motivated to modify Brune to use the noise cancellation system as taught by Eatwell so that a ambient noise, often associated with audibly perceptible annoyances, can be reduced, thus creating a quieter and more pleasant environment for a user. While Brune in view of Eatwell lack specific disclosure for reasoning used above, Cain provides support for that which is well known in the art of noise suppression. Cain teaches noise suppression is well known in the art to reduce substantial problems ranging from stress, safety hazards, and annoyance to physiological damage (1:1-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Brune to use the noise suppression in the gaming environment as taught by Eatwell and Cain, so that a user can have a more enjoyable gambling experience with less ambient noise. Heiwa teaches that pachinko game machines can have built in noise reduction units to reduce the noise from the game machines. The system facilitates noise reduction in response to predetermined conditions from the exterior of the game machine. Thus, Heiwa provides further evidence that it was known in the art at the time of the invention to reduce ambient noise in gaming halls though the use of noise reduction systems.

In re claims 14 and 21, Eatwell provides microphone and speakers isolated from each other (Fig. 12).

In re claims 16 and 22, Eatwell teaches that the ANR processing includes filtering (6:57-58).

In re claims 17 and 23, Eatwell teaches the ANR cancellation signal comes from

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speakers that also can produce sound from a main processor (6:61-64). Eatwell also teaches that the system was meant to be self-contained (6:18-24 and Fig. 12), which provides for the same speakers producing both game/multimedia sounds and ANR sounds.

In re claims 18 and 24, Eatwell teaches a plurality of speakers for driving both ANR sounds and game/multimedia sounds as discussed above. Such features would provide another speaker driven with game/multimedia sounds.

In re claims 19 and 24, Eatwell teaches microphone and speakers isolated from each other (Fig. 12).

Response to Arguments

Applicant's arguments with respect to claims 14-23 and 25-29 have been considered but are moot in view of the new ground(s) of rejection.

Citation of Pertinent Prior Art

US Pat. No. 6,638,169 to Wilder et al. teaches a system for gaming machines that reduces the level of ambient noise to surrounding players.

US Pat. No. 6,530,842 to Wells et al. teaches creating a sound reducing enclosure so that surrounding gaming/casino noise does not bother a player.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron L Enatsky whose telephone number is 703-305-3525. The examiner can normally be reached on 8-6 M-Th.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teresa Walberg can be reached on 703-308-1327. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ALE


Teresa Walberg
Supervisory Patent Examiner
Group 3700

Notice of References Cited	Application/Control No. 10/026,579		Applicant(s)/Patent Under Reexamination BARAHONA ET AL.	
	Examiner Aaron L Enatsky		Art Unit 3713	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,530,842	03-2003	Wells et al.	463/46
	B	US-6,638,169	10-2003	Wilder et al.	463/35
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	JP10277213A	10-1998	JAPAN	HEIWA	A63F 007/02
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/026,579
Applicants : Francisco Jose Paz Barahona
Timothy C. Loose
Filed : December 19, 2001
Title : Gaming Machine With Ambient Noise Attenuation

TC/A.U. : 3713
Examiner : Aaron L. Enatsky

Docket No. : 47079-00124USPT
Customer No. : 30223

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, Virginia 22313-1450

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, Mail Stop Amendment, P.O. Box 1450, Alexandria, Virginia 22313-1450, on July 15, 2004.

Signature: _____

Debra Ricks

RESPONSE TO OFFICE ACTION DATED MAY 5, 2004

Dear Sir:

This is in response to the Office Action dated May 5, 2004. The shortened statutory period for response is three months from the mailing date, *i.e.*, by August 5, 2004, and this response is being filed within that time period. Please enter the following remarks into the record for this application.

Remarks/Arguments begin on page 2 of this paper.

REMARKS/ARGUMENTS

Claims 14-23 and 25-29 remain in the application for further prosecution.

§ 103 Rejections

Acknowledging the receipt of the Applicants' Appeal Brief that was filed on February 23, 2004, the Examiner has withdrawn a final rejection dated August 28, 2003 in view of newly discovered art. Regarding the Applicants' arguments presented in the Appeal Brief, the Examiner's response has been limited to the following sentence: "Applicant's arguments with respect to claims 14-23 and 25-29 have been considered but are moot in view of the new ground(s) of rejection."

Claims 14-23 and 25-29 are now rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Number 5,851,148 ("Brune") in view of U.S. Patent Number 5,828,768 ("Eatwell"), in view of U.S. Patent Number 5,133,017 ("Cain"), and in view of JP 10-277213A ("Heiwa"). For the Examiner's convenience, the following documents have been attached as Appendix A: an English abstract of Heiwa provided by the Japanese Patent Office website (two pages) ("JPO Abstract"); a mechanical English translation of the Heiwa claims provided by the Japanese Patent Office website (two pages); a mechanical English translation of the Heiwa specification provided by the Japanese Patent Office website (twenty-two pages); a Japanese copy of Heiwa (thirty-one pages); and an alternative English abstract of Heiwa provided by Thomson Derwent (one page). Specifically, the Office Action alleges the following:

Heiwa teaches that pachinko game machines can have built in noise reduction units to reduce the noise from the game machines. The system facilitates noise reduction in response to predetermined conditions from the exterior of the game machine. Thus, Heiwa provides further evidence that it was known in the art at the time of

the invention to reduce ambient noise in gaming halls though [sic, through] the use of the noise reduction systems.

Heiwa does not support the Examiner's position. In fact, Heiwa only strengthens the Applicants' position. The problem sought to be solved by Heiwa is related to allowing a player to hear messages broadcasted through a gaming establishment's public address system ("p.a. system"). Appendix A, JPO Abstract. For example, Heiwa notes that the goal of the invention is to "make sound easier to hear, when transmission in a game parlor or back ground music is output using conventional transmission equipment," if a specified condition is satisfied. *Id.* Heiwa describes a specified condition being, for example, a worker that switches a microphone 12 to an ON position and, then, raises a volume knob 13 of the microphone 12 to a preset volume level for playing background music (e.g., music for closing time) over the p.a. system. According to Heiwa, the background music "takes precedence over playing sound of pachinko machines." *Id.*

In other words, the system disclosed by Heiwa is a game-establishment sound system that overrides sounds produced by a particular pachinko machine. In contrast, the current invention is directed generally to a gaming-machine sound system that, to an extent, overrides ambient noise sounds (e.g., sounds produced by a p.a. system). Accordingly, Heiwa discloses a system plagued with one of the exact type of problems that the present invention seeks to eliminate.

Based on the allegations of the Office Action, it seems that the use of Heiwa is directed to rebutting the following statement made by the Applicants in the Appeal Brief:

Furthermore, none of the references mentions anything about ambient noise in a gaming establishment, much less that ambient noise in gaming establishment is a problem

Appeal Brief, p. 7. If the “problem” solved by the present invention had been a player’s ability to hear information transmitted over an establishment’s p.a. system, then the reduction of noise taught by Heiwa might have been relevant. However, the

problem addressed by the Applicants is to provide a gaming machine that enhances its game sounds by minimizing interference from ambient noise produced by the surrounding environment.

Id. at pp. 8-9 (emphasis added). The Heiwa system does the opposite of the claimed system.

While the Heiwa system is directed to overriding the sounds from a game machine, the system of the present invention is directed to enhancing the sounds from the game machine. Thus, in contrast to the system of the present invention, the Heiwa system increases ambient noise relative to the gaming sounds of a particular game machine.

In short, the new position for rejecting the claims combines four different references, one of which, Heiwa, teaches the skilled artisan to do exactly the opposite of the present invention. If anything, Heiwa provides further support for the non-obviousness of the present invention by emphasizing one type of problem that the present invention seeks to solve.

The Applicants further note that the proposed combination of references fails for the additional reasons presented in the Appeal Brief, which are incorporated by reference. In fact the inclusion of Heiwa does not even remotely address the majority of the Applicants’ arguments presented in the Appeal brief. For example, reliance on Heiwa has nothing to do with the Applicants’ arguments that “the Examiner has misconstrued Brune and its teachings regarding desktop and laptop computers,” that “the Active Noise Reduction (ANR) of Eatwell focuses the

antinoise signal at the microphone to create a quiet zone at the microphone – not at the user of the personal computer,” that “Cain cannot be combined with Eatwell because there is no suggestion for combining Cain’s headrest system with Eatwell’s personal computer,” and that “the cited references do not teach all of the claim limitations – a gaming machine for broadcasting to the player (i) game sounds coordinated with the displayed representation and (ii) anti-noise sounds so as to enhance the game sounds.”

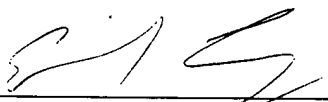
Thus, the Applicants respectfully request the Examiner to withdraw the rejections, and submit that all the pending claims are in condition for allowance at least for the above-stated applicable reasons.

Conclusion

It is the Applicants’ belief that all of the claims are now in condition for allowance and action towards that effect is respectfully requested. If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at the number indicated.

Respectfully submitted,

Date: July 15, 2004



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UNITED STATES

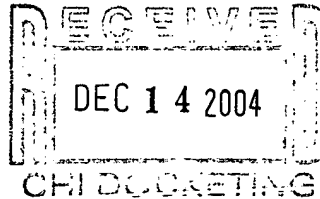
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,579	12/19/2001	Francisco Jose Paz Barahona	47079-0124	9546

30223 7590 12/09/2004

JENKENS & GILCHRIST, P.C.
225 WEST WASHINGTON
SUITE 2600
CHICAGO, IL 60606



EXAMINER

HOTALING, JOHN M

ART UNIT	PAPER NUMBER
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3713

DATE MAILED: 12/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

DOCKETED

INIT. PB DATE: 12/15/04

ACTION: Final Dec DATE: 3/9/05

Deadline — 6/9/05

Resp. to Probe — 2/9/05

Office Action Summary

Application No.

10/026,579

Applicant(s)

BARAHONA ET AL.

Examiner

John M Hotaling II

Art Unit

3713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-23 and 25-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-23 and 25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/19/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14-23, and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brune et al US Patent No. 5,851,148 ("Brune"), in view of Eatwell et al US Patent No. 5,828,768 ("Eatwell"), Cain et al. US Patent No. 5,133,017 ("Cain") and Heiwa JP 10-277213A.

In re claims 14, 20, and 26-29, Brune teaches a standard gaming machine that has elements of wagering, credit accepting and output mechanisms, bonus meters, and random outcome selection (1:1-2:67) all of which are well known in the gaming arts. Brune also teaches the devices that are used for gaming machines typically are computers, of which can be a desktop or laptop personal computers (5:25-48). Brune however, does not teach aspects of noise cancellation as claimed in the instant application. In an analogous invention Eatwell teaches integration of speakers and microphones into a personal computer to form a novel multi-media computer that contains noise cancellation electronics (Abstract). The noise cancellation suits an array of other electronics including a multimedia PC, video monitor, television, laptop computer, etc., which from the above types, would include gaming machines. The active noise cancellation circuit (ANR) in a multimedia PC detects ambient or unwanted noise

and produces a cancellation sound wave through the PC speakers (6:54-7:19). One would be motivated to modify Brune to use the noise cancellation system as taught by Eatwell so that a ambient noise, often associated with audibly perceptible annoyances, can be reduced, thus creating a quieter and more pleasant environment for a user. While Brune in view of Eatwell lack specific motivation for combining a noise cancellation system with a game machine other than just to reduce annoyances of unwanted noise, an analogous reference to Cain provides support for that which is well known in the art of noise suppression. Cain teaches noise suppression is well known in the art to reduce substantial problems ranging from stress, safety hazards, and annoyance to physiological damage (1:1-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Brune to use the noise suppression in the gaming environment as taught by Eatwell and Cain, so that a user can have a more enjoyable gambling experience with less ambient noise. Cain provides support and motivation to one of ordinary skill in the art to use a noise cancellation circuit in a game machine but Cain does not specifically state that the noise cancellation may be used in a game machine. Heiwa teaches that pachinko game machines can have built in noise reduction units to reduce the noise from the game machines. The system facilitates noise reduction in response to predetermined conditions from the exterior of the game machine. Thus, Heiwa provides further evidence that it was known in the art at the time of the invention to reduce ambient noise in gaming halls though the use of noise reduction systems. Additionally, as can be see from paragraph [0033] of Heiwa "Furthermore, invention of claim 10 constitutes a game machine including a modification means to change the loudness level of sound

of the game sound outputted by output means to output a game sound according to a game condition, sound-volume judging means to judge the loudness level of sound of alien frequencies, and said output means into the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by said sound-volume judging means.... [0061] Moreover, when carrying out [sound / game] noise reduction by the demand I from the hole computer 10..." The examiner reads this statement to mean that the game sounds can be enhanced or lowered depending on the desires of the game operator. In summary, It would have been obvious at the time of the invention to combine the above reference teach that it is obvious for a game machine (Brune) that uses a computer to have an active noise cancellation feature (Eatwell) in order to get rid of unwanted noise (Cain) or in order to enhance other sounds (Heiwa) in a game machine. One would be motivated to do so since noise suppression is well known in the art to reduce substantial problems ranging from stress, safety hazards, and annoyance to physiological damage as disclosed above by Cain.

In re claims 14 and 21, Eatwell provides microphone and speakers isolated from each other (Fig. 12).

In reclaims 16 and 22, Eatwell teaches that the ANR processing includes filtering (6:57-58).

In re claims 17 and 23, Eatwell teaches the *ANR* cancellation signal comes from speakers that also can produce sound from a main processor (6:61-64). Eatwell also teaches that the system was meant to be self-contained (6:18-24 and Fig. 12), which provides for the same speakers producing both game/multimedia sounds and ANR sounds.

In re claims 18 and 24, Eatwell teaches a plurality of speakers for driving both ANR sounds and game/multimedia sounds as discussed above. Such features would provide another speaker driven with game/multimedia sounds.

In re claims 19 and 24, Eatwell teaches microphone and speakers isolated from each other (Fig. 12).

Response to Arguments

2. Applicant's arguments filed 7/19/04 have been fully considered but they are not persuasive.

With respect to the applicant's arguments relative to Heiwa, the examiner considers the reference to Heiwa to be a reference which supports the motivation to combine all of the above references used in the rejection. Heiwa specifically teaches that it is known that a specific gaming machine may use noise cancellation techniques in order to enhance a sound. The examiner agrees that Heiwa is using the suppression system to primarily suppress game sounds but the system facilitates noise reduction in response to predetermined conditions from the exterior of the game machine.

Additionally as can be see from paragraph [0033] of Heiwa "Furthermore, invention of claim 10 constitutes a game machine including a modification means to change the loudness level of sound of the game sound outputted by output means to output a game sound according to a game condition, sound-volume judging means to judge the loudness level of sound of alien frequencies, and said output means into the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by said sound-volume judging means.... [0061] Moreover, when carrying out [sound / game] noise reduction by the demand I from the hole computer

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10..." The examiner reads this statement to mean that the game sounds can be enhanced or lowered depending on the desires of the game operator.

With respect to the applicant's assertion that none of the references disclose anything about the problems of ambient noise please see above where it is stated that one would be motivated to modify Brune to use the noise cancellation system as taught by Eatwell so that a ambient noise, often associated with audibly perceptible annoyances, can be reduced, thus creating a quieter and more pleasant environment for a user. Additionally, Cain provides support for that which is well known in the art of noise suppression. Cain teaches noise suppression is well known in the art to reduce substantial problems ranging from stress, safety hazards, and annoyance to physiological damage (1:1-13). Reducing ambient noise from a gaming hall while not specifically stated can be inferred from a reading of the above references.

In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

With respect to the applicant's arguments that the references do not teach the claimed invention please see above. With respect to the applicant's argument that the ANR of Eatwell focuses the anti-noise signal at the microphone to create a quiet zone at the microphone not at the user of a personal computer it can be seen in specified columns that other sounds are attenuated suing the system of Eatwell and the quite zone at the microphone is just one object of the invention. With respect to the argument

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that Cain cannot be combined with Eatwell because there is no suggestion for combining the headrest system with the personal computer the examiner notes that this is not the purpose of citing Cain. Cain is cited to provide motivation and teachings of what are well known in the art of noise cancellation.

With respect to the applicant's arguments that the cited reference do not teach all of the claim limitations "a gaming machine ..." Brune discloses game sound broadcasted to the player in accordance with a game display and the remainder of the reference teach that this broadcasted sound may be enhance or attenuated by noise cancellation features.

Citation of Pertinent Prior Art

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Konstantinou et al '201, Saikawa et al '896, Kamada et al '631, Hutzel et al '728, Ohki et al '572 all are related to active noise cancellation.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John M Hotaling II whose telephone number is (571) 272 4437. The examiner can normally be reached on Mon-Thurs 7:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xuan Thai can be reached on (571) 272 3507. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JOHN M. HOTALING, II
PRIMARY EXAMINER

December 7, 2004

Form PTO-1449 (modified)

LIST OF ART CITED BY APPLICANT

Sheet 1 of 2



Application No.: 10/026,579

Filing Date: December 19, 2001

First Named Inventor: Francisco Jose Paz Barahona
Timothy C. Loose

Group Art Unit: 3713

Examiner: Aaron L. Enatsky

Attorney Docket No.: 47079-00124USPT

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JUL 23 2004

TECHNOLOGY CENTER 370

U.S. PATENT DOCUMENTS

Examiner Initial	Ref.	Document Number	Date	Name	Class	Sub-Class	Filing Date (if Application)
<i>[initials]</i>	A1	2002/0039919	04/4/02	Joshi et al.	463	20	
<i>[initials]</i>	A2	2002/0090990	07/11/02	Telischak et al.	451	359	
<i>[initials]</i>	A3	2002/0151349	10/17/02	Joshi	463	20	
<i>[initials]</i>	A4	2003/0114214 A1	6/19/03	Barahona et al.	463	20	
<i>[initials]</i>	A5	2004/0029637	2/12/04	Hein, JR. et al.	463	35	
	A6	3,533,629	10/13/70	Raven	273	138	
	A7	4,522,399	6/11/85	Nishikawa	273	143R	
	A8	5,370,399	12/6/94	Liverance	273	434	
	A9	5,524,888	6/11/96	Heidel	463	22	
	A10	5,533,727	7/9/96	DeMar	463	23	
	A11	5,655,961	8/12/97	Acres et al.	463	27	
	A12	5,695,188	12/9/97	Ishibashi	273	143R	
	A13	5,807,177	9/15/98	Takemoto et al.	463	47	
	A14	5,833,538	11/10/98	Weiss	463	21	
	A15	5,941,773	8/24/99	Harlick	463	26	
	A16	5,971,850	10/26/99	Liverance	463	23	
	A17	6,068,552	5/30/00	Walker et al.	463	21	
	A18	6,089,663	7/18/00	Hill	297	258.1	
	A19	6,110,041	8/29/00	Walker et al.	463	20	
	A20	6,162,121	12/19/00	Morro et al.	463	16	
	A21	6,254,483	7/3/01	Acres	463	26	
	A22	6,302,790	10/16/01	Brossard	463	20	
	A23	6,315,666 B1	11/13/01	Mastera et al.	463	31	
	A24	6,422,941 B1	7/23/02	Thomer et al.	463	30	
<i>[initials]</i>	A25	6,561,908 B1	5/13/03	Hoke	463	35	

Not
considered

Examiner

Considered 12/6/04

*Examiner: Initial if citations considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

CHICAGO 288412v1 47079-00124USPT



Form PTO-1449 (modified) LIST OF ART CITED BY APPLICANT				Application No.: 10/026,579			
Sheet 2 of 2				Filing Date: December 19, 2001			
				First Named Inventor: Francisco Jose Paz Barahona Timothy C. Loose			
				Group Art Unit: 3713			
				Examiner: Aaron L. Enatsky			
				Attorney Docket No.: 47079-00124USPT			
FOREIGN PATENT DOCUMENTS							
Examiner Initial	Ref.	Document Number	Date	Country	Class	Sub-Class	Translation Yes/No
	B1	AU 199943487	3/2/00	Australia			
	B2	JP 5-31254	2/9/93	Japan			
OTHER DOCUMENTS (including author, title, date, pertinent pages, etc.)							
Examiner Initial	Ref.	Document Information					
	C1	Spotlight, Flip Flop Anchor Gaming, '00 Games (June 2000)					
	C2	STAR WARS VIDEO SLOTS, '03 Games (September 2003)					
EXAMINER				DATE CONSIDERED 12/16/04			

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JUL 23 2004

TECHNOLOGY CENTER 3700

*Examiner: Initial if citations considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

CHICAGO 288412v1 47079-00124USPT

Notice of References Cited

Application/Control No.

10/026,579

Applicant(s)/Patent Under
Reexamination
BARAHONA ET AL.

Examiner

John M Hotaling II

Art Unit

3713

Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,584,201	06-2003	Konstantinou et al.	381/57
	B	US-6,509,896	01-2003	Saikawa et al.	345/419
	C	US-5,995,631	11-1999	Kamada et al.	381/1
	D	US-2003/0117728	06-2003	Hutzel et al.	359/838
	E	US-5,689,572	11-1997	Ohki et al.	381/71.3
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-277213

(43)Date of publication of application : 20.10.1998

(51)Int.Cl.

A63F 7/02

A63F 7/02

(21)Application number : 09-084168

(71)Applicant : HEIWA CORP

(22)Date of filing : 02.04.1997

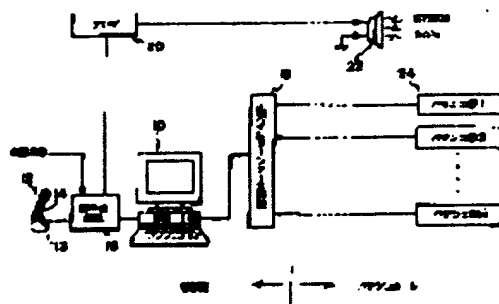
(72)Inventor : AKASAKA MICHIHARU

(54) SOUND CONTROLLING SYSTEM AND GAME MACHINE

(57)Abstract:

PROBLEM TO BE SOLVED: To make sound easier to hear, when transmission in a game parlor or back ground music is output using conventional transmission equipment by providing a sound controlling means to output a sound shutting-off signal to a game machine, when specified conditions are satisfied at the time of transmitting sound information through a transmitting means capable of transmitting the input sound information.

SOLUTION: If specified conditions are satisfied, a hall computer 10 outputs sound shutting-off (sound reducing) request to an output interface device 18. That is, the voltage level of a request signal line is raised from the ground level to the source level. At this point, a specified condition is satisfied, for example, if a worker switches an on/off switch 14 of a microphone 12 to on, a volume knob 13 of the microphone 12 is set to a specified volume level or higher, music generated by a sound generating device 16 is turned to specified music (music for closing time), or the like. In these cases, transmitting in a game parlor or BGM(back ground music) takes precedence over playing sound of pachinko machines.



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CLAIMS

[Claim(s)]

[Claim 1] It is the sound control system which will perform silence or sound control of a game machine which carries out noise reduction for this game sound if a silence signal is inputted from the exterior while outputting a game sound according to a game condition. The sound control system characterized by having the broadcast means which can broadcast the sound information inputted into the game hole in which said game machine was installed, and the sound control means which outputs said silence signal to said game machine when broadcasting sound information with said broadcast means and predetermined conditions are satisfied.

[Claim 2] Said sound control means is a sound control system according to claim 1 characterized by considering that said predetermined conditions were satisfied at least when it changed to the condition which can broadcast said broadcast means and predetermined sound information was broadcast by said broadcast means, and when the loudness level of sound of the output sound of said broadcast means was set up more than a predetermined loudness level of sound to one of cases, and outputting said silence signal to them.

[Claim 3] A game machine including the silence circuit which has the operation which reduces the voltage level of the electrical signal inputted into said output means to a predetermined voltage level when the potential of the signal line which was connected to an output means to output a game sound based on the inputted electrical signal, said output means, and the electric target, and was connected with the source of an external signal is in agreement with predetermined potential.

[Claim 4] When the silence signal which requires silence or noise reduction of a game sound as an output means to output a game sound based on the inputted electrical signal is inputted from the outside, The 1st control means which changes and outputs the sound data corresponding to the loudness level of sound of the usual game sound to the data corresponding to the loudness level of sound used as silence or noise reduction, A game machine including the 2nd control means which changes the sound information on said game sound into the electrical signal based on the sound data which said 1st control means outputted, and outputs it to said output means.

[Claim 5] Said 1st control means is a game machine according to claim 4 characterized by changing and outputting said sound data to the data corresponding to the loudness level of sound used as silence or noise reduction when the input of said silence signal continues beyond fixed time amount.

[Claim 6] The broadcast means which can broadcast the sound information inputted into the game hole in which it is the sound control system which performs sound control of the game machine which has the function to change the loudness level of sound of a game sound according to the inputted sound-volume translation data, and said game machine was installed, The sound control system characterized by having the sound control means which outputs the sound-volume translation data defined according to the class of sound information broadcast to said game machine in case sound information is broadcast by said broadcast means.

[Claim 7] The broadcast means which can broadcast the sound information inputted into the game hole in which it is the sound control system which performs sound control of the game machine which has

the function to change the loudness level of sound of a game sound according to the inputted sound-volume translation data, and said game machine was installed. The sound control system characterized by having the sound control means which outputs the sound-volume translation data defined according to the loudness level of sound of the sound information broadcast to said game machine in case sound information is broadcast by said broadcast means.

[Claim 8] When the sound-volume translation data matched with the loudness level of sound of a game sound is inputted as an output means to output a game sound based on the inputted electrical signal, from the outside. The 1st control means which changes and outputs the sound data of the game sound corresponding to the usual loudness level of sound to the sound data of the loudness level of sound corresponding to said sound-volume translation data into which it was inputted, A game machine including the 2nd control means which changes the sound information on said game sound into the electrical signal based on the sound data which said 1st control means outputted, and outputs it to said output means.

[Claim 9] The game machine which includes silence or the silence means which carries out noise reduction for the game sound outputted by said output means when it judges that the loudness level of sound of alien frequencies is more than a predetermined loudness level of sound with a sound-volume judging means to judge whether the loudness level of sound of alien frequencies turned into more than the predetermined loudness level of sound to be an output means to output a game sound according to a game condition, and said sound-volume judging means.

[Claim 10] A game machine including a modification means to change the loudness level of sound of the game sound outputted by output means to output a game sound according to a game condition, sound-volume judging means to judge the loudness level of sound of alien frequencies, and said output means into the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by said sound-volume judging means.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the game machine by which sound control is carried out with the sound control system which a sound control system and a game machine are started, and the broadcast sound which the public address system of the game hole in which the game machine, for example, a pachinko machine, was installed outputs to a detail, and the game sound outputted according to a game condition from a game machine are interlocked, and carries out an output control, and this sound control system, and the game machine which has the function which carries out sound control according to alien frequencies to equipment itself.

[0002]

[Description of the Prior Art] Conventionally, the pachinko parlor has the public address system which outputs speech information to the pachinko hole in which two or more sets of pachinko machines were installed by a loudspeaker etc., performs the announcement over a store's public address system for transmitting various kinds of information to a game visitor using this public address system, or is directing the image of a store by passing background music (henceforth "BGM"). the loudspeaker (sound display magnifier) of a pachinko hole connected to the microphone installed in the management office for the public address system installed in the pachinko parlor to supervise each pachinko machine, the player which carries out the playback output of the music currently recorded on record media, such as CD (compact disk), and a microphone and a player -- since -- it is constituted.

[0003] Such the public address system and a pachinko machine of a pachinko hole are respectively constituted by the exception object, and outputs, such as an announcement over a store's public address system by the public address system and BGM, and the output of the game sound at the time of being the game which a pachinko machine outputs (for example, sound showing the fanfare at the time of being great success) were mutually controlled by the former independently.

[0004] However, if [a pachinko machine] only the game sound based on the sound information signal inside equipment can be outputted, it becomes difficult to output the sound of varieties and it is inadequate in respect of the signal transduction to a game visitor.

[0005] Then, an external device and pachinko machines, such as a hole computer currently installed in the management office, are connected to JP,8-150242,A, and the pachinko machine in which a stereo output is possible is indicated by multiplex in the sound information signal from the outside, and the sound information signal inside a pachinko opportunity. That is, if the sound information on BGM or an announcement over a store's public address system is set up as sound information on external, neither BGM nor an announcement over a store's public address system will flow only from the loudspeaker installed in head lining of a pachinko hole etc. like before, but BGM and an announcement over a store's public address system will be outputted with a game sound from the loudspeaker of a pachinko machine.

[0006] Moreover, according to the technique given [this] in an official report, according to the priority defined beforehand, the example which carries out sound control so that either the sound information on

external and the sound information on internal may be outputted is also given. For example, if fluctuation of a pattern etc. is specially started by the pachinko machine side when music is outputted as external information, the fluctuating sound as internal information will be given priority to and outputted. Moreover, also in great success, when there is emergency intelligence (for example, fire information) from the management office, the emergency intelligence is given priority to and outputted. [0007]

[Problem(s) to be Solved by the Invention] However, in the conventional pachinko machine given [above-mentioned] in an official report, a means how to set up the loudness level of sound of each sound information in the case of multiplex broadcasting which outputs two or more sound information from the loudspeaker with which the pachinko machine itself was equipped is not indicated. For this reason, there is a problem that listening comprehension of one of sound information becomes difficult at least depending on the class and loudness level of sound of sound information which are outputted. [0008]

Moreover, with the above-mentioned conventional technique, linkage with the sound output of the announcement over a store's public address system by the conventional public address system formed separately or BGM and the sound output of a pachinko machine is not considered as a pachinko machine. That is, the problem of the difficulty of catching of the sound made when only the output of the sound information outputted from the loudspeaker of the pachinko machine itself is set as the object of control with the conventional technique, it is unstated about the sound control at the time of using the conventional public address system simultaneously and it uses together with the public address system for this reason is unsolved. When BGM etc. is passed in a loan only with the loudspeaker of the Koide force of a pachinko machine, the sound from other pachinko machines is mixed and for directing the image of the whole store by BGM, it becomes it with lack of ability. [0009]

In addition, the above problems are problems universally produced in the game hole which uses not only the pachinko hole in which the pachinko machine is installed but the game machines (a pachinko machine, throttle machine, etc.) which generally emit a game sound. [0010]

When this invention is accomplished in consideration of the above-mentioned data and an announcement over a store's public address system and BGM are outputted using the conventional public address system, it aims at offering the sound control system and game machine which made those sounds easy to catch. [0011]

[Means for Solving the Problem] In order to attain the above-mentioned object, invention of claim 1 In the sound control system which will perform silence or sound control of a game machine which carries out noise reduction for this game sound if a silence signal is inputted from the exterior while outputting a game sound according to a game condition It is characterized by having the broadcast means which can broadcast the sound information inputted into the game hole in which said game machine was installed, and the sound control means which outputs said silence signal to said game machine when broadcasting sound information with said broadcast means and predetermined conditions are satisfied. [0012]

In invention of claim 1, when a sound control means broadcasts sound information with a broadcast means and predetermined conditions are satisfied, a silence signal is outputted to the game machine installed in the game hole, the game sound which was being outputted when the silence signal was inputted from the sound control system, while the game machine outputted the game sound according to the game condition -- silence (a game sound disappears) -- or noise reduction (the loudness level of sound of a game sound falls) is carried out. Thus, while it becomes possible to make broadcast and a game sound easy to catch even if it uses a certain broadcast means from the former since broadcast by the broadcast means and the game sound output by the game machine are interlocked and it controls by this invention, the production of the image of the whole store by BGM is attained. [0013]

Moreover, it considers that said predetermined conditions were satisfied at least at one of cases when said sound control means of claim 1 was changed to the condition which can broadcast said broadcast means and predetermined sound information was broadcast by said broadcast means like invention of claim 2, and when the loudness level of sound of the output sound of said broadcast means was set up more than a predetermined loudness level of sound, and you may make it output said silence

signal.

[0014] Here, when it changed into the condition which can broadcast a broadcast means, the changeover switch of the microphone for announcements over a store's public address system (contained in a broadcast means) may have been changed [*****] to ON. Moreover, when predetermined sound information is broadcast by the broadcast means, the sound generation equipment (contained in a broadcast means) which outputs [*****] the music recorded on the record medium etc. may broadcast predetermined BGM. Moreover, when the loudness level of sound of the output sound of a broadcast means was set up more than a predetermined loudness level of sound, the case where the volume tongue of the microphone for announcements over a store's public address system is set up more than predetermined level, and the volume tongue of the above-mentioned sound generation equipment may have been set [*****] up more than predetermined level. Thus, by making it setting out of a broadcast means interlocked with, and performing sound control of a game machine, the system which is easier to use is realizable.

[0015] Moreover, invention of claim 3 constitutes a game machine including the silence circuit which has the operation which reduces the voltage level of the electrical signal inputted into said output means to a predetermined voltage level, when the potential of the signal line which was connected to an output means output a game sound based on the inputted electrical signal, said output means, and the electric target, and was connected with the source of an external signal is in agreement with predetermined potential.

[0016] In invention of claim 3, when the potential of the signal line connected with the source of an external signal is in agreement with predetermined potential, a silence circuit reduces the voltage level of the electrical signal inputted into an output means to a predetermined voltage level. In addition, the game sound which an output means outputs when the voltage level of the electrical signal inputted into an output means is made in agreement with a ground is muffled, when reducing the voltage level of the electrical signal inputted into an output means to a certain voltage level higher than a ground, the loudness level of sound of the game sound which an output means outputs falls, and noise reduction is carried out. It is made for a class of broadcast, a loudness level of sound, etc. by the broadcast means of the game opportunity exterior to be interlocked with, and while it will become possible to make broadcast and a game sound easy to catch of it even if it uses a certain broadcast means from the former if the source of an external signal sets up whether it is in agreement with predetermined potential in the potential of a signal line, the production of the image of the whole store by BGM of it is attained. Moreover, since it is realizable in the easy circuit which consists of combination of a transistor and resistance, it becomes easy [the installation to the game store of the game machine by which sound control is carried out in the source of an external signal] very [the silence circuit which has the above-mentioned operation].

[0017] Moreover, when the silence signal which requires silence or noise reduction of a game sound as an output means to output a game sound based on the electrical signal into which invention of claim 4 was inputted is inputted from the outside, The 1st control means which changes and outputs the sound data corresponding to the loudness level of sound of the usual game sound to the data corresponding to the loudness level of sound used as silence or noise reduction, A game machine is constituted including the 2nd control means which changes the sound information on said game sound into the electrical signal based on the sound data which said 1st control means outputted, and outputs it to said output means.

[0018] In invention of claim 4, when the silence signal with which the 1st control means requires silence or noise reduction of a game sound is inputted from the outside, the sound data corresponding to the loudness level of sound of the usual game sound are changed and outputted to the data corresponding to the loudness level of sound used as silence or noise reduction. Next, the 2nd control means changes the sound information on a game sound into the electrical signal based on the sound data which the 1st control means outputted, and outputs it to an output means. And an output means outputs a game sound with silence or the loudness level of sound by which noise reduction was carried out. That is, this invention muffles in software to invention of claim 3 muffling in hard (noise reduction) (noise

reduction).

[0019] It is made for a class of broadcast, a loudness level of sound, etc. by the broadcast means of the game opportunity exterior to be interlocked with also in this invention, and while it will become possible to make broadcast and a game sound easy to catch even if it uses a certain broadcast means from the former if the system which inputs a silence signal from the exterior is formed, the production of the image of the whole store by BGM is attained. Moreover, since this invention which muffles in software (noise reduction) just also needs to prepare the input edge where a silence signal is inputted into the 1st control means and the 2nd control means etc. can divert the conventional thing, the installation to the game store of the game machine by which sound control is carried out becomes very easy.

[0020] Moreover, like invention of claim 5, when the input of said silence signal continues said 1st control means of claim 4 beyond fixed time amount, you may constitute so that said sound data may be changed and outputted to the data corresponding to the loudness level of sound used as silence or noise reduction.

[0021] even if a silence signal inputs into the 1st control means in invention of claim 5 -- promptly silence or the case where did not carry out noise reduction but a silence signal continues beyond fixed time amount -- silence -- or noise reduction is carried out, if a silence signal is inputted into the 1st control means from the game opportunity exterior at the output initiation event of an announcement over a store's public address system or BGM, after an announcement over a store's public address system will continue beyond fixed time amount in this invention, for example -- a game sound -- silence -- or noise reduction is carried out. It is lost that a game sound is muffled frequently in response to unprepared microphone actuation etc. by this, and a possibility of spoiling a game visitor's interest can be prevented.

[0022] Moreover, invention of claim 6 is set to the sound control system which performs sound control of the game machine which has the function to change the loudness level of sound of a game sound according to the inputted sound-volume translation data. It is characterized by having the sound control means which outputs the sound-volume translation data set to it according to the class of sound information broadcast when sound information was broadcast with the broadcast means which can broadcast the inputted sound information, and said broadcast means by the game hole in which said game machine was installed to said game machine.

[0023] In invention of claim 6, a sound control means outputs the sound-volume translation data defined according to the class of sound information broadcast by the broadcast means to a game machine. And a game machine changes the loudness level of sound of a game sound according to the inputted sound-volume translation data. Thus, in this invention, since it enabled it to change the loudness level of sound of the game sound of a game machine according to the class of sound information broadcast, finer sound control is attained. For example, there is an advantage that sound-volume setting out of the game sound according to BGM or the significance of broadcast can be performed. Moreover, it is compatible on high level, respectively in the image production (or the alarm and advice by broadcast to a game visitor) of the store by BGM, and the interest by the game sound.

[0024] You may make it output a sound control means here as sound-volume attenuation data in which it is shown directly how many loudness levels of sound you may output as a command which requires as how much the loudness level of sound of for example, a game machine should be set for sound-volume translation data, or are decreased.

[0025] Furthermore, invention of claim 7 is set to the sound control system which performs sound control of the game machine which has the function to change the loudness level of sound of a game sound according to the inputted sound-volume translation data. It is characterized by having the sound control means which outputs the sound-volume translation data set to it according to the loudness level of sound of the sound information broadcast when sound information was broadcast with the broadcast means which can broadcast the inputted sound information, and said broadcast means by the game hole in which said game machine was installed to said game machine.

[0026] In invention of claim 7, a sound control means outputs the sound-volume translation data defined according to the loudness level of sound of the sound information broadcast to a game machine, in case

sound information is broadcast by the broadcast means. And a game machine changes the loudness level of sound of a game sound according to the inputted sound-volume translation data. Thus, in this invention, since the loudness level of sound of a game sound was changed according to the loudness level of sound of the sound information broadcast, finer sound control is attained.

[0027] Here, in case sound information is broadcast by the broadcast means, there is a volume tongue for setting up the above-mentioned microphone and the loudness level of sound of sound generation equipment etc. as a means to set up a loudness level of sound, and this system can also be constituted so that you may make it this volume tongue interlocked with and sound-volume translation data may be outputted.

[0028] Moreover, when the sound-volume translation data matched with the loudness level of sound of a game sound is inputted as an output means to output a game sound based on the electrical signal into which invention of claim 8 was inputted, from the outside, The 1st control means which changes and outputs the sound data of the game sound corresponding to the usual loudness level of sound to the sound data of the loudness level of sound corresponding to said sound-volume translation data into which it was inputted, A game machine is constituted including the 2nd control means which changes the sound information on said game sound into the electrical signal based on the sound data which said 1st control means outputted, and outputs it to said output means.

[0029] In invention of claim 8, when the sound-volume translation data with which the 1st control means is matched with the loudness level of sound of a game sound is inputted from the outside, the sound data of the game sound corresponding to the usual loudness level of sound are changed and outputted to the sound data of the loudness level of sound corresponding to the sound-volume translation data into which it was inputted. Next, the 2nd control means changes the sound information on a game sound into the electrical signal based on the sound data which the 1st control means outputted, and outputs it to an output means. And an output means outputs the game sound of the loudness level of sound corresponding to the inputted sound data.

[0030] In this invention, it is made for a class of broadcast, a loudness level of sound, etc. by the broadcast means of the game opportunity exterior to be interlocked with, and if the system which inputs sound-volume translation data from the exterior is formed, even if it will use a certain broadcast means from the former, fine sound control is attained, and it becomes possible to make it further easy to catch of broadcast or a game sound. Moreover, that the input edge which inputs sound-volume translation data into the 1st control means is prepared, and the 1st control means should just carry out control which changes sound data as mentioned above based on the voice data inputted from this input edge, since the 2nd control means etc. can divert the conventional thing, it becomes easy [the installation to the game store of the game machine by which sound control is carried out as mentioned above] very [it].

[0031] Moreover, invention of claim 9 constitutes a game machine for the game sound outputted by said output means including silence or the silence means which carries out noise reduction, when it judges that the loudness level of sound of alien frequencies is more than a predetermined loudness level of sound with a sound-volume judging means to judge whether the loudness level of sound of alien frequencies turned into more than the predetermined loudness level of sound to be an output means to output a game sound according to a game condition, and said sound-volume judging means.

[0032] the game sound to which a silence means is outputted by the output means when it judges that the loudness level of sound of alien frequencies is more than a predetermined loudness level of sound with a sound-volume judging means in invention of claim 9 -- silence -- or noise reduction is carried out, thus -- this invention -- the signal from the outside -- a game sound -- silence or the judgment result of a sound-volume judging means with which did not carry out noise reduction but the game machine was equipped -- a game sound -- silence -- or noise reduction is carried out. Also in this case, while it becomes possible to make broadcast and a game sound easy to catch even if it uses a certain broadcast means from the former since a game machine is interlocked with an external broadcast sound and sound control can be carried out, the production of the image of the whole store by BGM is attained.

[0033] Furthermore, invention of claim 10 constitutes a game machine including a modification means to change the loudness level of sound of the game sound outputted by output means to output a game

sound according to a game condition, sound-volume judging means to judge the loudness level of sound of alien frequencies, and said output means into the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by said sound-volume judging means.

[0034] In invention of claim 10, a modification means changes the loudness level of sound of the game sound outputted by the output means into the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by the sound-volume judging means. Also in this invention which has by this a means by which the game machine itself carries out [sound / game] sound control, the fine sound control interlocked with alien frequencies is attained.

[0035]

[Embodiment of the Invention] Hereafter, the pachinko machine as one example of the sound control system applied to the gestalt of operation of this invention with reference to a drawing and a game machine is explained.

[0036] (Gestalt of the 1st operation) The example of a configuration of the sound control system concerning the gestalt of operation of the 1st of this invention is shown in drawing 1. The hole computer 10 for a sound control system to manage each pachinko machine installed in the pachinko hole, as shown in this drawing, The output interface device 18 which outputs the command signal for the sound control to each pachinko machine based on the command of the sound control from this hole computer 10, The microphone 12 for voice broadcast, and the sound generation equipment 16 which generates the given sound information as a sound signal (electrical signal), the loudspeaker 22 which is installed in the amplifier 20 which amplifies the sound signal from this sound generation equipment 16, and the predetermined location (for example, Hitoshi Amai) of a pachinko hole, and changes the magnification signal of this amplifier 20 into an acoustic wave, and is outputted as an announcement over a store's public address system or BGM -- since -- it is constituted.

[0037] The pachinko machine (it considers as the pachinko machine 1, pachinko machine 2, ..., pachinko machine N) of N base installed in the pachinko hole is connected to the output interface device 18, and the demand output from the hole computer 10 is inputted into the pachinko machine 1 - N.

[0038] It connects with the hole computer 10 and sound generation equipment 16 outputs a sound signal based on the control command from the hole computer 10. This sound generation equipment 16 is realizable as the so-called player which changes into a sound signal the sound information (BGM etc.) currently recorded on record media, such as CD (compact disk) and a cassette. In this case, two or more CDs etc. are stored and it may be made to carry out the playback output of the CD at sequence according to the command and the given program from the hole computer 10.

[0039] Moreover, the terminal a microphone 12 and for wire broadcasting is connected to sound generation equipment 16, and sound generation equipment 16 can make the sound signal and the sound signal of wire broadcasting which were inputted from the microphone 12 output from a loudspeaker 22 through amplifier 20. In addition, the selecting switch which sets output turning on and off to sound generation equipment 16 to each input sound signal, such as a microphone, and which is not illustrated is formed, and the output sound signal is made selectable by this selecting switch. When ON setting out of two or more input signals is carried out, sound generation equipment 16 overlaps and outputs these sound signals.

[0040] Moreover, the microphone 12 is equipped with the changeover switch 14 which changes turning on and off of a microphone input, the volume tongue 13 for adjusting the loudness level of sound of input voice, and **.

[0041] Next, the outline configuration of the important section of the hole computer 10 is shown in drawing 2. As shown in this drawing, the hole computer 10 CPU50 which follows a predetermined program, and controls and manages the whole equipment, RAM52 used as a work area of ROM51 and CPU50 where the above-mentioned program was stored, It is constituted including the hard disk 53 constituted as a magnetic recording medium, and the input/output interface circuit 57 which controls the interface of data I/O to an external instrument, and connects with the bus 56 by which each transmits a command and data.

[0042] The administrative data 55 used in case the sound control information 54 and each pachinko

machine in which it is shown how the game sound of each pachinko machine, and the announcement over a store's public address system and BGM from a loudspeaker 22 are interlocked, and are controlled at least are managed are stored in the hard disk 53. CPU50 reads such information into RAM52 suitably, and performs control based on the information concerned.

[0043] Moreover, sound generation equipment 16 and the output interface device 18 are connected to the input/output interface circuit 57. The microphone turning-on-and-off information that sound generation equipment 16 shows as ON and off any the changeover switch 14 of a microphone 12 is set, the microphone volume setting-out information which shows as which loudness level of sound the volume tongue 13 of a microphone 12 is set, and the sound generation device-control information that sound generation equipment makes it identify in which condition the sound output is performed are transmitted to CPU50 through the input/output interface circuit 57. And CPU50 transmits a control command to sound generation equipment 16 through the input/output interface circuit 57.

[0044] In addition, there is information which shows any sound generation equipment 16 shall output between the sound information on a record medium (it explains as CD hereafter), the sound information on wire broadcasting, and the sound information from a microphone 12 as the above-mentioned sound generation device control information. Moreover, when the sound information on CD is being outputted, the information which shows which CD is played, playback loudness levels of sound (for example, CD number corresponding to a music name etc.), etc. are contained. That is, all the information relevant to sound generation equipment 16 is under the monitor of the hole computer 10. Moreover, there are initiation of the command (you may change with the above-mentioned selecting switch) of any of playback of wire broadcasting or CD to choose as the above-mentioned control command and the playback output of CD or a command of a halt, a command of any of CD which are stored two or more sheets to reproduce, etc.

[0045] Moreover, CPU50 judges whether priority is given to an announcement over a store's public address system or BGM over the game sound of a pachinko machine based on sound generation device control information, and outputs the command by this decision result to the output interface device 18 through the input/output interface circuit 57. As this command, there is a loudness level of sound (gestalt of the 3rd operation) of the silence output mentioned later or a noise reduction output (the 1st, gestalt of the 2nd operation), the command (gestalt of the 3rd operation) set up for every class of BGM, and the game sound which a pachinko machine outputs etc.
 [0046] Next, the detailed example of a configuration of the output interface device 18 is explained using drawing 3. In addition, with the gestalt of the 1st operation, the hole computer 10 outputs the demand (noise reduction output I) which carries out [sound / which muffles the game sound which a pachinko machine outputs / the demand (silence output I) or this game sound] noise reduction.

[0047] As shown in drawing 3, the output interface device 18 consists of the pachinko machine 1, a pachinko machine 2,, relay 40 formed respectively corresponding to the pachinko machine N. In addition, these relays are realized as a normally open way type contact type relay which carries out off in the state of a return (coil condition of not energizing) and which carries out close by operating state (coil energization condition).

[0048] The earth wire 42 connected to the ground (GND) of the signal line 41 for transmitting the output (henceforth Demand I) of the silence or noise reduction from the hole computer 10 and the hole computer 10 is connected to the input terminal of each relay 40. Moreover, the earth wire 44 connected to the ground (GND) of the input signal line 43 for inputting Demand I into the corresponding pachinko machine 1 - N and each pachinko machine is connected to the output terminal of each relay 40.

[0049] Silence or when not carrying out noise reduction, the hole computer 10 carries out ground connection of the signal line 41 for the game sound of a pachinko machine. In this case, since the voltage level of a signal line 41 turns into a grand level, relay 40 does not operate, but therefore will be in the condition that the input signal line 43 and the earth wire 44 have not connected, and, thereby, a pachinko machine can detect that Demand I is not outputted from the hole computer 10.

[0050] On the other hand, silence or when carrying out noise reduction, the hole computer 10 outputs the demand I of a fixed voltage level for the game sound of a pachinko machine through a signal line 41.

In this case, relay 40 operates, the input signal line 43 and an earth wire 44 are connected, and, thereby, a pachinko machine can detect that Demand I was outputted from the hole computer 10.

[0051] Next, the circuitry of the part (sound control system) relevant to the sound control in the pachinko machine 24 is explained using drawing 4.

[0052] as show in drawing 4, the pachinko machine 24 be equip with the setting out frequency of a game sound, CPU60 which output data including the information on a loudness level of sound through a data line (for example, 8 bits), and the sound generation controller (SGC) 62 which generate the sound signal of the game sound actually output based on the received data received from this data line according to each game condition while it control and manage each configuration section of a pachinko machine. Moreover, CPU60 controls the timing of the data transfer of SGC62 by the control line.

[0053] SGC62 is equipped with the tone generator which generates the tone of a game sound, extracts the attenuator data in which the loudness level of sound of each tone is shown from received data, and sets this tone generator as the attenuator counter of each tone while it extracts the frequency data in which the frequency of each tone is shown from the received data received from the data line and sets them as a tone counter. SGC62 generates the sound signal of the frequency defined with the frequency data set as the tone counter, and the attenuator data set as the attenuator counter, and a loudness level of sound.

[0054] In addition, the attenuator data set to an attenuator counter are given in a predetermined bit (for example, 4 bits), and sound-volume setting out of a predetermined phase (in the case of 4 bits, they are 16 steps) of them is attained by carrying out the compound activity of each bit till OFF (silence) from 0dB (sound-volume max). Here, attenuator data are data in which the magnitude of attenuation when being based on the maximum sound volume of SGC62 was shown with dB value. That is, the magnitude of attenuation is so large that dB value of attenuator data is large, and sound volume becomes small.

[0055] Furthermore, SGC62 is equipped also with the noise generator for making the noise of white nature superimpose to a game sound. The attenuator data in which noise sound volume is shown also to this noise sound exist.

[0056] + side plate of a capacitor 68 is connected to the outgoing end of SGC62, and ground connection of between this capacitor 68 and the outgoing end of SGC62 is carried out to it through the capacitor 64 and resistance 66 by which the series connection was carried out. Moreover, ground connection of the - side plate of a capacitor 68 is carried out through the resistance 70 and resistance 72 by which the series connection was carried out.

[0057] Moreover, it connects with + side input terminal of the amplifier 74 which amplifies a sound signal between resistance 70 and resistance 72, and ground connection of the - side input terminal of amplifier 74 is carried out. The outgoing end of amplifier 74 is connected with one input terminal of the loudspeaker 28 which outputs the game sound of a pachinko machine through a capacitor 76. And ground connection of the input terminal of another side of a loudspeaker 28 is carried out. In addition, this loudspeaker 28 is attached in the direction [the left upper right] section of the game frame 29 surrounding the game board 27 of the pachinko machine 24 as shown in drawing 6.

[0058] Although the component explained above is the configuration of being used for the output of the sound signal of the usual loudness level of sound, in addition to this configuration, it is preparing the following components (silence configuration section) with the gestalt of the 1st operation for silence (noise reduction).

[0059] That is, as shown in drawing 4, the collector of the transistor 80 of an NPN mold is connected to + side input terminal of amplifier 74, and the collector of the transistor 86 of an PNP mold is connected to the base of this transistor 80 through resistance 84. In addition, the base and the emitter of a transistor 80 are connected through resistance 82.

[0060] The emitter of a transistor 86 is connected with the power source VDD supplied from the power-source block which is not illustrated, and the base of a transistor 86 is connected with the input signal line 43 of the output interface device 18 through resistance 90. And the emitter and the base of a transistor 86 are connected through resistance 88. In addition, ground connection of the earth wire 44 of the output interface device 18 is carried out inside the pachinko machine 24.

[0061] Moreover, when carrying out [sound / game] noise reduction by the demand I from the hole computer 10, resistance 78 is made to intervene between the collector of the above-mentioned transistor 80, and + side input terminal of amplifier 74. On the other hand, resistance 78 is not made to intervene when muffling a game sound by the demand I from the hole computer 10. That is, the collector of the above-mentioned transistor 80 is directly connected to + side input terminal of amplifier 74.

[0062] Furthermore, if resistance 78 is constituted from a variable resistor and it enables it to set up 0 [omega], it is possible to set up silence and the silence level of arbitration.

[0063] Next, an operation of the gestalt of this operation is explained. By formation of predetermined conditions, the hole computer 10 outputs the demand I of silence (noise reduction) to the output interface device 18. That is, it pulls up to the level of the power source Vcc which does not illustrate the voltage level of the signal line 41 of Demand I from a grand level.

[0064] Here, when predetermined conditions are satisfied, a salesclerk changes [*****] the on-off switch 14 of a microphone 12 to ON and the volume tongue 13 of a microphone 12 is set up by more than the predetermined loudness level of sound, the case where the music generated by sound generation equipment 16 turns into predetermined music (music at the time of closing etc.) etc. can be considered. It corresponds, when it gives priority to an announcement over a store's public address system or BGM over the game sound of a pachinko machine in these cases.

[0065] Based on the microphone turning-on-and-off information that sound generation equipment 16 inputs into the hole computer 10, microphone volume setting-out information, sound generation device control information, etc., CPU50 of the hole computer 10 judges whether these predetermined conditions were satisfied.

[0066] If Demand I is inputted into the output interface device 18 of drawing 3, since relay 40 will be in operating state, it will be in the condition that the input signal line 43 and the earth wire 44 were connected.

[0067] In this connection condition, a transistor 86 carries out ON actuation and, as a result, a transistor 80 also serves as ON. By ON actuation of a transistor 80, the collector will be in the condition that abbreviation ground connection was carried out. Furthermore, since the input terminal of amplifier 74 is connected to them when not placed between the collectors of a transistor 80 by resistance 78, + side input terminal of amplifier 74 will be in the condition of abbreviation ground connection by the above-mentioned ON actuation. Therefore, the sound signal outputted from SGC62 is extinguished, and the game sound from a loudspeaker 28 is muffled.

[0068] On the other hand, when resistance 78 intervenes, the electrical potential difference of the sound signal inputted into + side input terminal of amplifier 74 changes with ON actuation of a transistor 80. Here, why the voltage level of a sound signal changes is explained below. In addition, r3 and ground potential are set [the voltage level of the sound signal outputted through the capacitor 68 from SGC62 / the resistance of v0 and resistance 70 / the resistance of r1 and resistance 72] to 0 for the resistance of r2 and resistance 78.

[0069] Voltage level v1 impressed to + side input terminal of amplifier 74 since the series connection of resistance 70 and the resistance 72 is carried out when a transistor 80 is OFF $v1 = r2 v0 / (r1 + r2)$ (1) It becomes. on the other hand, voltage level v2 by which abbreviation ground connection of the resistance 78 was carried out, and the series connection of what connected resistance 72 and resistance 78 to juxtaposition was carried out to resistance 70 when a transistor 80 carried out ON actuation and which is rich, and is impressed to + side input terminal of amplifier 74 since it can make $v2 = r2 r3 v0 / (r1 r2 + r1 r3 + r2 r3)$
 $= r2 v0 / (r1 r2 / r3) (+r1 + r2)$ (2) It becomes.

[0070] (1) A formula and (2) It is (2) when a formula is compared. Except that the term of $(r1 r2 / r3)$ exists in the denominator of a formula, other terms of a molecule and a denominator are the same. Since it is forward, all resistance is (2). The denominator of a formula is always (1). It becomes larger than the denominator of a formula and, therefore, is $v1 > v2$. It is always materialized. That is, if a transistor 80 carries out ON actuation when resistance 78 is made to intervene, the sound signal of a voltage level smaller than the voltage level of the sound signal at the time of OFF will be inputted into + side input

terminal of amplifier 74, therefore the game sound of sound volume smaller than the usual game sound will be outputted from a loudspeaker 28 (noise reduction).

[0071] On the other hand, since it will be in the condition that relay 40 does not operate and the input signal line 43 and the earth wire 44 are not connected when Demand I is not inputted into the output interface device 18 of drawing 3, a transistor 86 serves as OFF. When a transistor 86 is OFF, a current is not supplied to the base of a transistor 80, but a transistor 80 serves as OFF, therefore, the sound signal outputted from SGC62 -- silence -- or without carrying out noise reduction, it is amplified with amplifier 74 and outputted as a game sound of the usual loudness level of sound with a loudspeaker 28.

[0072] in addition, the game sound of all the pachinko machines connected to the output interface 18 shortly after the demand I of the silence or noise reduction from the hole computer 10 is inputted into the output interface device 18, since the signal line 41 and earth wire 42 of drawing 3 are connected to all relays 40 formed corresponding to each pachinko machine -- silence -- or noise reduction is carried out.

[0073] the case where he wants to give priority to an announcement over a store's public address system over the game sound of a pachinko machine with the gestalt of the 1st operation as mentioned above like [when the volume tongue 13 of a microphone 12 is set up by more than the predetermined loudness level of sound], for example when a salesclerk changes the on-off switch 14 of a microphone 12 to ON -- the game sound of a pachinko machine -- silence -- or noise reduction is carried out. Thereby, while being able to make easy to catch an announcement over a store's public address system, an announcement over a store's public address system becomes possible also with small sound volume.

[0074] Moreover, since silence or noise reduction is made corresponding to BGM to give priority to BGM like [when the music generated by sound generation equipment 16 turns into predetermined music (music at the time of closing etc.)], the image (sound) of a pachinko parlor can be directed, without mixing various game sounds. It becomes unnecessary moreover, to make sound volume of BGM into max.

[0075] Moreover, the gestalt of the 1st operation can attain the above-mentioned effectiveness by easy circuitry as shown in drawing 4.

[0076] in addition -- the example of drawing 4 -- the output of SGC62 -- silence -- or although it was made to carry out noise reduction, it is shown in drawing 5 -- as -- a loudspeaker 28 side -- silence -- or you may constitute so that noise reduction may be carried out.

[0077] In the example of a configuration of drawing 5, ground connection of the capacitor 76 which omitted the silence configuration section explained by drawing 4, instead was connected to the outgoing end of amplifier 74 is carried out through the resistance 92 and resistance 94 by which the series connection was carried out. And the point between resistance 92 and resistance 94 is connected with the input signal line 43 from relay 40 while connecting with one terminal of a loudspeaker 28. In addition, ground connection of the earth wire 44 of the output interface device 18 is carried out inside the pachinko machine 24. Moreover, when carrying out [sound / game] noise reduction by the demand I from the hole computer 10, resistance 96 is made to intervene between the point between the above-mentioned resistance 92 and resistance 94, and the input signal line 43. On the other hand, resistance 96 is not made to intervene when muffling a game sound by the demand I from the hole computer 10.

[0078] Next, actuation of the circuit of drawing 5 is explained. If the demand I from the hole computer 10 is inputted into the output interface device 18 by formation of predetermined conditions, since relay 40 will be in operating state by it, it will be in the condition that the input signal line 43 and the earth wire 44 were connected. In the state of this connection, since ground connection of the ends child of a loudspeaker 28 is carried out, a sound signal is extinguished, and the game sound from a loudspeaker 28 is muffled.

[0079] On the other hand, above (1) when resistance 96 intervenes (2) For the reason same with having explained using the formula, the voltage level of the sound signal which amplifier 74 outputted falls, and noise reduction is carried out [sound / which is outputted from a loudspeaker 28 / game].

[0080] Thus, in the example of a circuit of drawing 5, the same effectiveness can completely be done so with a still easier configuration than the circuit of drawing 4. In addition, transistors 86 and 80 are

abolished also in drawing 4 . and you may make it control directly with a relay like drawing 5 .
 (Gestalt of the 2nd operation) Next, the gestalt of the 2nd operation is explained, although the gestalt of the 1st operation was silence or the case where noise reduction was carried out, about the sound signal in hard -- CPU of a pachinko machine -- minding -- software ---like -- a sound signal -- silence -- or noise reduction can also be carried out. This is explained below as a gestalt of the 2nd operation. In addition, the sign same about the same configuration as the gestalt of the 1st operation is attached, and detailed explanation is omitted.

[0081] The circuitry of the output interface device 18 concerning the gestalt of the 2nd operation is shown in drawing 7 . As shown in this drawing, the signal line 41 of Demand I is connected to the base of the transistor 32 of an NPN mold through resistance 30, and an earth wire 42 is connected to the emitter of a transistor 32. And resistance 31 is made to intervene between the signal lines 41 and earth wires 42 which were inserted into the base of resistance 30 and a transistor 32. The component which consisted of these transistor 32 and resistance 30 and 31 is prepared for every pachinko machine 1 - N, and each is connected with a signal line 41 and an earth wire 42.

[0082] Furthermore, the output interface device 18 is equipped with the photo coupler 36 which consists of photo transistors 38 used as ON when the light of LED37 and this LED37 is detected for every pachinko machine 1 - N. Resistance 34 is anode minded [of LED37 of a photo coupler 36], and it is a power source (Vcc). The power-source line 45 to supply is connected and the corresponding collector of a transistor 32 is connected to the cathode edge of LED37. In addition, the power-source line 45 is the power source (Vcc) of the hole computer 10. It connects.

[0083] Moreover, the collector of a photo transistor 38 is connected with the input signal line 43 of the demand I of a corresponding pachinko machine, and the emitter of a photo transistor 38 is connected with the earth wire 44 of a corresponding pachinko machine.

[0084] Silence or when not carrying out noise reduction, the hole computer 10 carries out ground connection of the signal line 41 for the game sound of a pachinko machine. In this case, since the voltage level of a signal line 41 turns into a grand level, a transistor 32 is not turned on, therefore, a current does not flow to LED37, either and LED37 does not emit light. Therefore, a photo transistor 38 is not turned on but the signal input line 43 and an earth wire 44 will be in a connectionless condition.

[0085] On the other hand, silence or when carrying out noise reduction, the hole computer 10 outputs the demand I of H level for the game sound of a pachinko machine through a signal line 41. In this case, since a transistor 32 serves as ON, a current flows and emits light to LED37 by which the anode edge was connected to the power source Vcc. If LED37 emits light, since the photo transistor 38 which received the light will serve as ON, the input signal line 43 and an earth wire 44 will be in a connection condition.

[0086] Next, the circuitry (the 1st example) of the pachinko machine 24 concerning the gestalt of the 2nd operation is explained using drawing 8 .

[0087] As shown in drawing 8 . CPU60 is constituted from a gestalt of the 2nd operation so that the data for detecting Demand I can be inputted, and the data line 99 for this entry of data is connected to CPU60. And the data line 99 and the input signal line 43 from the output interface device 18 are connected, and ground connection of the earth wire 44 is carried out inside the pachinko machine 24. Furthermore, the data line 99 is connected with a power source Vcc through resistance 98.

[0088] Since a photo transistor 38 turns on as it already said that Demand I is inputted from the hole computer 10, ground connection of the data line 99 connected to the input signal line 43 is carried out, and a current flows the data line 99 through resistance 98 from a power source Vcc. At this time, the voltage signal of L level is inputted into CPU60 through the data line 99 as a result of ON actuation of a photo transistor 38.

[0089] On the other hand, since a photo transistor 38 does not turn on as already stated when Demand I is not inputted from the hole computer 10, a current does not flow to the data line 99, but, therefore, the voltage signal of H level is inputted into CPU60. Thus, CPU60 can detect whether Demand I was inputted from the hole computer 10 by whether the signal of either L level and H level was inputted.

[0090] Next, the circuitry (the 2nd example) of the pachinko machine 24 concerning the gestalt of the

2nd operation is explained using drawing 9 .

[0091] As shown in drawing 9 . in the 2nd example of the gestalt of the 2nd operation. it constitutes CPU60 so that an output of the silence (noise reduction) output O may be possible. and it not only forms the data line 99. but forms the output-data line 101 for transmitting this silence (noise reduction) output O. In addition. the silence (noise reduction) output O is set to OFF (it does not muffle) at the time of ON (silence) and L level at the time of H level.

[0092] And the base of the transistor 100 of an NPN mold is connected to the data line 101 through resistance 102. and while carrying out ground connection of the emitter of a transistor 100. the base and an emitter are connected through resistance 104. Moreover. the collector of a transistor 100 is connected between resistance 70 and resistance 72.

[0093] Moreover. when carrying out [sound / game] noise reduction. resistance 106 is made to intervene between the nodes between the collector of the above-mentioned transistor 100. resistance 70. and resistance 72. In addition. resistance 106 is not made to intervene when muffling a game sound.

[0094] Next. the main routine of the pachinko machine 24 concerning the gestalt of the 2nd operation is explained using the flow chart of drawing 10 . In addition. this main routine is repeatedly performed by the reset signal of every predetermined time (for example. 4.0 [ms]) in CPU60.

[0095] As shown in the flow chart of drawing 10 , it first judges whether it is the power-source ON first time of this pachinko machine 24 (a power source is turned on and it is the first processing), i.e., the first time which changed from the power-source OFF condition to the power-source ON condition. (step 200). The data memorized by RAM (with no graphic display) in order to make this pachinko machine into an initial state in the case of the power-source ON first time (step 200 affirmation judging) are eliminated (clear) (step 202). an initial data required in order to perform this main routine further after this is set to RAM (step 204). and the following reset signal is stood by.

[0096] After a main routine starts. this main routine is again performed by reset from step 200 after 4.0 [ms] progress. but since the power source is already switched on. the power-source ON first time does not come (step 200 negation judging). but the next common processing 1 is performed (step 206). In this common processing 1. the random-number update process which updates the random number for. for example. determining the pattern displayed on a pattern drop etc. is performed.

[0097] Next. if it judges whether it is [error] under generating (step 208) and is [error] under generating (step 208 affirmation judging). error processing for coping with the generated error will be performed (step 210). and it will shift to step 214.

[0098] In not error being under generating. it performs game related processing of (Step 208 Negative judging). winning-a-prize processing of the pachinko machine 24. etc. (step 212). and a timer count is performed (step 213). In processing of this timer count. processing which subtracts or **** the various timers set up by game related processing of the above-mentioned step 212 etc. for this the main routine activation of every (every [namely.] reset signal) is performed.

[0099] Next. sound processing for setting the attenuator data and frequency data of game sounds (fanfare sound at the time of great success etc.) which are outputted according to the game conditions (for example. a great success condition. an access condition. etc.) generated by game related processing of step 212 to the register which the CPU60 interior does not illustrate is performed (step 214). The detail of this sound processing is mentioned later. In addition. when error processing is performed at step 210. output processing of an error sound is also performed.

[0100] And the attenuator data and frequency data which were set up by CPU60 are outputted to SGC62 (step 216). As mentioned above. each tone of a game sound is generated on the loudness level of sound which the attenuator data and frequency data which were inputted into SGC62 are set to the attenuator counter and tone counter of SGC62. and the set attenuator data show. and the frequency which the set frequency data show.

[0101] And common processing 2 is performed (step 220). In this common processing 2. processing of external information output set processing. awarded-balls control processing. indicator control buffer set processing. lamp display processing. an LED display data set. etc. is performed. for example. And whenever it stands by the following reset signal and a reset signal is detected. the same processing as the

above is performed from step 200.

[0102] Next, the detail of sound processing of step 214 of drawing 10 is explained using the flow chart of drawing 11.

[0103] As shown in the flow chart of drawing 11, the usual sound data according to progress of a musical piece are set first (step 230). This usual sound data consists of the attenuator data and frequency data in which the usual loudness level of sound is shown.

[0104] Next, it judges whether the voltage signal inputted from the data line 99 of whether there is any demand of the silence (noise reduction) from the hole computer 10 and CPU60 is L level (step 234). In addition, the voltage signal showing this demand is outputted from the hole computer 10, when predetermined conditions (example is the same as the gestalt of the 1st operation) are satisfied.

[0105] When the voltage signal without the demand of silence (noise reduction) case [the voltage signal] namely, inputted is H level (step 234 negation judging), the return of this subroutine is carried out. In this case, the sound data of the usual loudness level of sound set up at step 234 will be outputted.

[0106] The next processing is performed when the voltage signal with the demand of silence (noise reduction) case [the voltage signal] namely, inputted is L level (step 234 affirmation judging). That is, in the case of the example of a configuration of drawing 8, attenuator data are added by noise reduction level ((1) of step 236). Since the magnitude of attenuation which attenuator data show increases by noise reduction level by this addition processing, the loudness level of sound of the sound data set up at step 230 declines. However, when the added result has exceeded the greatest magnitude-of-attenuation data, the greatest magnitude-of-attenuation data (here off data) are set.

[0107] Moreover, when muffling a musical piece, off data (off level) are re-set to attenuator data. In addition, when changing attenuator data into the value for silence or noise reduction, the attenuator data of a noise sound are also changed with the attenuator data about all tones.

[0108] original attenuator data -- progress of a musical piece -- following -- changing (it changing for every note) -- the attenuator data by which noise reduction was carried out at step 236 also change on the level by which fixed level noise reduction was carried out from an original change. Therefore, the musical piece to which the tone or tune of a musical piece did not change depending on noise reduction processing of step 236, and only the loudness level of sound fell is outputted.

[0109] Since it is outputted to SGC62 at step 216 of drawing 10 and the sound signal of a loudness level of sound based on the data concerned is generated from SGC62, silence or the noise reduction of the attenuator data set up by CPU60 becomes possible in software by the demand from the hole computer 10.

[0110] Moreover, in the case of the example of a configuration of drawing 9, when there is a demand of silence (noise reduction), (Step 234 Affirmation judging) and CPU60 set a silence (noise reduction) output ((2) of step 236). That is, the voltage level of the output-data line 101 is set as H from L. At this time, the electrical potential difference of H level is impressed to the base of a transistor 100, and a transistor 100 serves as ON. Therefore, since ground connection of the + side input terminal of amplifier 74 is carried out through the collector of a transistor 100, and an emitter when it is the silence between which it is not placed by resistance 106, a sound signal is extinguished and the game sound outputted from a loudspeaker 28 is muffled.

[0111] On the other hand, since parallel connection of resistance 72 and the resistance 106 is carried out when it is the noise reduction between which it is placed by resistance 106, it is (1) of the gestalt of the 1st operation. (2) For the same reason as the formula explained, the voltage level of the sound signal inputted into + side input terminal of amplifier 74 falls, and, thereby, noise reduction is carried out [sound / which is outputted from a loudspeaker 28 / game].

[0112] Next, as shown in drawing 12, when there is a demand of noise reduction from the hole computer 10 (step 234 affirmation judging), the frequency data to which the octave was reduced from usual may be set ((3) of step 240). Thereby, since the octave of a game sound falls, it becomes possible to catch and translate an announcement over a store's public address system and BGM like the case where a loudness level of sound is reduced.

[0113] Moreover, it is still more effective if frequency data with an octave lower than usual are set

combining the case where the attenuator data for noise reduction are set, and the case where a noise reduction output is set.

[0114] In the above example, shortly after there was an input of a silence (noise reduction) demand, it muffled [sound / game] (noise reduction), but if it muffles in response to unprepared microphone actuation etc. (noise reduction), since a game visitor's interest will be spoiled, after fully checking, it is necessary to muffle (noise reduction). The example of the sound processing which took such a measure is explained using the flow chart of drawing 13 .

[0115] As shown in the flow chart of drawing 13 , the usual sound data according to progress of a musical piece are set first (step 299). If there is a demand input of silence (noise reduction) (step 300 affirmation judging), as for CPU60, a silence demand detection flag will judge whether it is set to 1 (step 302). When the silence demand detection flag is not set to 1 (step 302 negation judging), a silence demand detection flag is set to 1 (step 304), and a silence demand detection timer is started (step 306). In addition, this silence demand detection timer is ****(ed) one every count at step 213 of drawing 10 , whenever a main routine is performed. That is, the counted value of a silence demand detection timer shows the time amount which passed from the event of the demand of silence (noise reduction) being inputted into CPU60.

[0116] And counted value T0 predetermined in the counted value of a silence demand detection timer It judges whether it has exceeded or not (step 308). In addition, when the silence demand detection flag is set to 1, it shifts to step 308 promptly, without performing (Step 302 Affirmation judging), step 304, and step 306. That is, it is the flag which shows whether the silence demand detection timer has already started the silence demand detection flag.

[0117] Counted value T0 predetermined in the counted value of a silence demand detection timer When having exceeded (step 308 affirmation judging), a silence continuation down timer is set (step 310). This one-count silence continuation down timer is subtracted at a time at step 213 of drawing 10 , whenever a main routine is performed, and subtraction is stopped when counted value is in agreement with 0. Moreover, a silence demand input is T0. While time amount is exceeded, and the silence demand input is continuing even after an end set is carried out, step 310 is passed and it returns to initial value.

[0118] Next, it judges whether the silence continuation down timer is in agreement with 0 (step 316). In addition, counted value T0 predetermined in the counted value of a silence demand detection timer Step 316 is performed without setting (negative Step 308 Judging) silence continuation down timer, when having not exceeded.

[0119] When the silence continuation down timer is in agreement with 0 (step 316 affirmation judging), the return of this subroutine is carried out promptly. In this case, the sound data of the usual loudness level of sound set at step 299 will be outputted.

[0120] When the silence continuation down timer is not in agreement with 0 (step 316 negation judging), with the 1st-example configuration (drawing 8), attenuator data are added by noise reduction level ((1) of step 320), and a silence (noise reduction) output is set with the 2nd-example configuration (drawing 9) ((2) of step 320). And the return of this subroutine is carried out.

[0121] Thus, in sound processing of drawing 13 , even if a silence (noise reduction) demand input serves as ON, it is not muffled [sound / game] promptly (noise reduction). After a demand input serves as ON, it is after predetermined time continuation (detection of the silence demand input in step 300 continues). Consequently, the counted value of a silence demand detection timer is T0. This condition is continued until it is muffled [sound / game] (noise reduction) and a silence continuation down timer is in agreement with 0, when it exceeds.

[0122] On the other hand, the condition is T0, although the end demand input occurred when there was no demand input of silence (noise reduction) or. It does not continue beyond time amount, but when it has disappeared (step 300 negation judging), a silence demand detection flag is cleared (step 312), and while stopping a silence demand detection timer, it clears (step 314), and judges [whether it is in agreement to 0 in the silence continuation down timer with step 316, and]. In this case, even if the demand input of silence (noise reduction) is lost, as long as the count-down of a silence continuation down timer is still performed, a set or a silence (noise reduction) output is set for the attenuator data for

silence (noise reduction). That is, the demand input of silence (noise reduction) is muffled [sound / game] between ** also as off (noise reduction).

[0123] Since according to sound processing of drawing 13 it was made to muffle beyond fixed time amount when a silence demand input continued (noise reduction), being muffled [sound / game] in response to unprepared microphone actuation etc. (noise reduction) is lost, and a possibility of spoiling a game visitor's interest can be prevented. Furthermore, in sound processing of drawing 13, since silence discharge is carried out when a silence demand breaks off beyond fixed time amount during silence, it does not react to unprepared silence cancellation. In this way, even if it turns a microphone on and off frequently, a game sound has direct the advantage that the difficulty of catching of the broadcast sound in the case of not reacting but reacting to an operation mistake sensitively can be prevented.

[0124] Here, the timing diagram of the silence demand and sound output in sound processing of drawing 13 is shown to drawing 25. In addition, it sets to this drawing and is T0. The reference value (the minimum duration time of the silence demand at the time of carrying out silence initiation) of a silence demand detection timer, and T1 It is the set value of a silence continuation down timer.

[0125] As shown in drawing 25, a silence demand is fixed time amount T0. Silence of a sound output is started from the event of passing. After silence is started, off actuation of the silence demand is once carried out after a certain time amount progress, but since ON actuation is again carried out before a silence continuation down timer is set to 0, this off actuation is canceled. That is, it turns out that the pachinko machine has not reacted to unprepared silence cancellation. Moreover, after off actuation is carried out again, a sound output is set to ON after T1-hour progress, and a silence condition is extinguished. However, this T1 Although ON actuation of the silence demand is once carried out between time amount, this ON actuation is T0. It is canceled in order not to continue beyond time amount. That is, it turns out that the pachinko machine has not reacted to an unprepared silence demand.

[0126] In addition, it is T0 and T1 to the relation of $T1 = T0 + \alpha$ (therefore $T0 < T1$), using the float over unprepared silence cancellation as alpha. It is desirable to set up.

[0127] As mentioned above, with the gestalt of the 2nd operation, when there was a demand from the hole computer 10, it was shown that silence (noise reduction) of a pachinko machine can be performed in software through CPU60. Therefore, also in the gestalt of the 2nd operation, the same effectiveness as the gestalt of the 1st operation can be done so.

[0128] In addition, with the gestalt of the 2nd operation, although the hole computer 10 and CPU60 of the pachinko machine 24 are connected through the output interface device 18, since it connects through a photo coupler 36 and has not connected electrically directly, by the output interface device 18 (drawing 7) concerning the gestalt of the 2nd operation, adverse effects, such as a noise, can be prevented mutually.

(Gestalt of the 3rd operation) It is also possible to control a game sound by the gestalt of the 1st and the 2nd operation still more finely according to the class of demand, although the demand from the hole computer 10 was whether to muffle [sound / game] (noise reduction). This is explained below as a gestalt of the 3rd operation. In addition, about the same configuration as the gestalt of the 1st and the 2nd operation, the same sign is attached and detailed explanation is omitted.

[0129] The circuitry of the output interface device 18 concerning the gestalt of the 3rd operation is shown in drawing 14. In addition, at the gestalt of the 3rd operation, it is three data I1, I2, and I3. The class of demand is specified with the demand command which becomes settled with a value (H level or L level).

[0130] As shown in drawing 14, three signal lines 111, 112, and 113 and earth wires 110 for transmitting the demand command (I1, I2, and I3) outputted from the hole computer 10 are connected to the output interface device 18.

[0131] The change circuit which consists of the transistor 32 of an NPN mold, a photo coupler 36, and various kinds of resistance is connected to each of signal lines 111, 112, and 113 like the configuration (drawing 7) of the output interface device concerning the gestalt of the 2nd operation. Namely, with the gestalt of the 3rd operation, the three same change circuits are prepared for every one pachinko

opportunity. Moreover, in the collector of each photo transistor 38 corresponding to one pachinko opportunity, it is I1, I2, and I3. The input signal lines 121, 122, and 123 for inputting into one set of a pachinko machine are connected, respectively, and the earth wire 124 connected to the grand level of the pachinko machine concerned is further connected to the emitter of each photo transistor 38.

[0132] Signal lines I11, I12, and I13 are respectively connected to three change circuits which branching extension was carried out and were respectively prepared for every pachinko machines [all] of other. That is, the demand command (I1, I2, and I3) outputted from the hole computer 10 is transmitted to all the pachinko machines connected to the output interface device 18.

[0133] Next, the configuration of the pachinko machine 24 concerning the gestalt of the 3rd operation is explained using drawing 15. As shown in this drawing, CPU60 is constituted from a gestalt of the 3rd operation so that a demand command (I1, I2, and I3) can be inputted, and the input data lines 128, 129, and 130 for this command entry of data are connected to CPU60. And the input data lines 128, 129, and 130 and the input signal lines 121, 122, and 123 from the output interface device 18 are connected respectively, and ground connection of the earth wire 124 is carried out inside the pachinko machine 24. Furthermore, the input data lines 128, 129, and 130 are connected with a power source Vcc through resistance 125, 126, and 127.

[0134] When the demand command (I1, I2, and I3) from the hole computer 10 is inputted into an output interface device, it is I1, I2, and I3. The photo transistor 38 of each change circuit is turned on and off by any of H level and L level they are. Ground connection of the photo transistor 38 is carried out by becoming ON, and, as for the input data line connected to the photo transistor 38 used as ON, a current flows through resistance (125, 126, or 127) from a power source Vcc. At this time, the voltage signal of L level is inputted into CPU60 as a result of ON actuation of a photo transistor 38.

[0135] On the other hand, since requested data is L level, and the input data line connected to the photo transistor 38 which became off is separated from ground potential, a current does not flow but, therefore, the voltage signal of H level is inputted into CPU60.

[0136] Thus, although a demand command (I1, I2, and I3) is inputted into CPU60, this command data is I1, I2, and I3. Eight kinds exist with that combination which is any of H level and L level. CPU60 can identify the class of demand from the hole computer 10 by judging eight kinds of any the inputted requested data is. Of course, it is also possible to change the number of input data lines according to the number of the classes of demand.

[0137] Next, sound processing of the pachinko machine concerning the gestalt of the 3rd operation is explained using the flow chart of drawing 16. In addition, since the main routine of the pachinko machine concerning the gestalt of the 3rd operation is the same as that of the gestalt of the 2nd operation, explanation is omitted (refer to drawing 10).

[0138] As shown in the flow chart of drawing 16, in sound processing (step 214 of drawing 10) of the pachinko machine concerning the gestalt of the 3rd operation, CPU60 of the pachinko machine 24 sets the usual sound data according to progress of a musical piece first (step 249). Next, it judges whether the demand command (I1, I2, and I3) from the hole computer 1 is normal mode data ("H" and "H"" H") (step 250). When judged with normal mode data (step 252 affirmation judging), the return of this subroutine is carried out. That is, the game sound of the usual loudness level of sound will be outputted in this case.

[0139] On the other hand, when the received demand command is judged to be data other than the normal mode (step 250 negation judging), the sound-volume attenuation data beforehand defined according to the received demand command are added to the attenuator data set at step 249 (step 254). And the return of this subroutine is carried out.

[0140] The attenuator data with which sound-volume attenuation data were added are outputted to SGC62 at step 216 of drawing 10, and the game sound by which sound-volume attenuation was carried out by sound-volume attenuation data is generated from the usual loudness level of sound.

[0141] Here, the example of a set of the sound-volume attenuation data corresponding to a demand command in step 254 is explained with actuation of the hole computer 10 using drawing 17. In addition, attenuator data (sound-volume attenuation data to add) are expressed by 4-bit data, and one sound-

volume setting out (magnitude of attenuation) or OFF (silence) of 15 steps to 0dB (sound-volume max; with no magnitude of attenuation) - 28dB (in drawing concerning the gestalt of operation, 24 is max) (sound-volume min; magnitude-of-attenuation max) is chosen by the value of each bit.

[0142] As shown in drawing 17, in "having no broadcast", the hole computer 10 sends out normal mode data ("H" and "H"" H") as a demand command (I1, I2, and I3). The pachinko machine which received this command adds 0 to the usual attenuator data as sound-volume attenuation data. That is, the usual attenuator data set at first are held, and the sound-volume attenuation level of a game sound is set to 0dB. When you have no broadcast, naturally it is because it is not necessary to make sound volume of a game sound small. In addition, in the flow chart of drawing 16, sound-volume attenuation data are set to 0 as a result by not performing addition processing of sound-volume attenuation data at the time of normal mode data reception.

[0143] Moreover, when the game sound precedence BGM is being passed, the hole computer 10 sends out a demand command ("H"" H", "L"). The pachinko machine which received this command adds 3 to the usual attenuator data as sound-volume attenuation data. At this time, the sound-volume attenuation level of a game sound is set to -6dB. Since priority is given to some extent to a game sound, the magnitude of attenuation of the sound volume of a game sound is stopped small. In addition, the sound-volume attenuation level of drawing 17 shows the magnitude of attenuation from the usual loudness level of sound with negative dB value.

[0144] Furthermore, when the BGM precedence BGM is being passed, the hole computer 10 sends out a demand command ("H", "L"" H"). The pachinko machine which received this command adds 10 to the usual attenuator data as sound-volume attenuation data. At this time, the sound-volume attenuation level of a game sound is set to -20dB. It is because priority is given to BGM, so it is necessary to stop the sound volume of a game sound small.

[0145] Furthermore, when broadcasting commercials, the hole computer 10 sends out a demand command ("H", "L", "L"). The pachinko machine which received this command adds 15 to the usual attenuator data as sound-volume attenuation data. At this time, a game sound is not attenuation and is muffled thoroughly (OFF). It is because it is necessary to tell a game visitor so that there may be no failure in hearing of commercials. In addition, when broadcasting using a microphone 12, an operator specifies the class of broadcast using input means, such as a keyboard and a mouse, and the hole computer 10 sends out a demand command to the hole computer 10 according to the class of specified broadcast to identify the class of broadcast.

[0146] Furthermore, in advice of a great success start, the hole computer 10 sends out a demand command ("L" and "H"" H"). The pachinko machine which received this command adds 5 to the usual attenuator data as sound-volume attenuation data. At this time, the loudness level of sound of a game sound is set to -10dB. It is because it is necessary to tell a game visitor both a game sound and the advice of a great success start.

[0147] Moreover, when broadcasting the advice of the close of this pachinko machine, the hole computer 10 sends out a demand command ("L"" H", "L"). The pachinko machine which received this command adds 15 to the usual attenuator data as sound-volume attenuation data. At this time, it is muffled [sound / game] thoroughly (OFF). It is because it is necessary to tell a game visitor so that there may be no failure in hearing of advice of the close.

[0148] Moreover, when broadcasting advice of closing, the hole computer 10 sends out a demand command ("L", "L"" H"). The pachinko machine which received this command adds 12 to the usual attenuator data as sound-volume attenuation data. At this time, the loudness level of sound of a game sound is set to -24dB. It is because it is necessary to tell a game visitor about being the time amount of closing certainly.

[0149] In addition, the gestalt of the 3rd operation is not limited to the example of drawing 17, and can be changed arbitrarily suitably.

[0150] Although the sound-volume attenuation data added to attenuator data according to a demand command were set up in the above example, the sound-volume attenuation data itself may be conversely directed directly from the hole computer 10. In this case, since the information on each bit is sent out

corresponding to attenuator data when sound-volume attenuation data are 4 bits. (I1, I2, I3, and I4) are needed as data inputted into a pachinko machine from a hole computer. In this case, in drawing 14 and drawing 15, while changing an input signal line into four, it also prepares at a time four change circuits which consist of a transistor 32, a photo coupler 36, and various kinds of resistance about one set of a pachinko machine (not shown).

[0151] Next, by sending out 4-bit sound-volume attenuation data as mentioned above explains the sound processing by the side of the pachinko machine in the case of performing sound-volume control of a game sound using the flow chart of drawing 18.

[0152] As shown in the flow chart of drawing 18, the usual sound data according to progress of a musical piece are set first (step 259). Here, when not receiving sound-volume attenuation data, the return of (Step 260 Negative judging) and this subroutine is carried out. In this case, the game sound of the usual loudness level of sound will be generated.

[0153] When sound-volume attenuation data are received (step 260 affirmation judging), the received sound-volume attenuation data are added to the usual attenuator data (step 264), and the return of this subroutine is carried out. In addition, the hole computer 10 side transmits the sound-volume attenuation data defined for every class of broadcast or BGM, as shown in drawing 17. Moreover, you may make it send out the sound-volume attenuation data interlocked with the setting-out level of the volume tongue 14 of a microphone 12 as examples other than this, as shown in the table of drawing 19 (a) and drawing 19 (b).

[0154] In the example of drawing 19 (a), when the microphone 12 is set to OFF, it is regarded as what does not broadcast and considers as sound-volume attenuation data (I1, I2, I3, and I4) = (0000). That is, the loudness level of sound of a game sound is set as max. In addition, although each bit of the sound-volume attenuation data of each table of drawing 19 is expressed by "0" or "1", "0" corresponds to L level and "1" supports H level. And the sound-volume attenuation data which consider that are that to which the intention of broadcast became strong, and are sent out are changed from (0001) to (1110) as microphone volume setting out becomes sound-volume foscete sound-volume size. That is, the loudness level of sound of a game sound is small set up with buildup of microphone volume. When microphone volume setting out becomes max, sound-volume attenuation data are set as (1111), and a game sound is set to OFF (silence).

[0155] On the contrary, since broadcast can be heard even if a game sound becomes large if microphone volume is raised, the view that the loudness level of sound of a game sound can be enlarged with buildup of microphone volume is also made. Drawing 19 (b) showed such an example, and when microphone volume setting out is OFF, sound-volume attenuation data are set to (1000) (the loudness level of sound of a game sound is equivalent to 16dB). In this case, since it does not broadcast, naturally silence of a game sound is not carried out. And when you enlarge [sound / game] and microphone volume becomes max as microphone volume increases to sound-volume foscete sound-volume size, let sound volume of (0000, i.e., a game sound) be the maximum level for sound-volume attenuation data.

[0156] As mentioned above, with the gestalt of the 3rd operation, as shown in drawing 17, you make it the sound types and loudness level of sound of broadcast or BGM interlocked with, and the game sound of a pachinko machine was set as various loudness levels of sound. Thereby, finer sound control was attained as compared with the gestalt of the 1st and the 2nd operation. For example, there is an advantage that sound-volume setting out of the game sound according to BGM or the significance of broadcast can be performed. Moreover, it is compatible on high level, respectively in the interest by the game sound, the interest according to a game sound in the image production of the store by BGM, and the picking partition by the game visitor by broadcast.

(Gestalt of the 4th operation) With the gestalt of the 1st - the 3rd operation, although sound control of the pachinko machine was carried out by the signal from a hole computer, the pachinko machine itself may carry out sound control. This is explained below as a gestalt of the 4th operation. In addition, the sign same about the same configuration as the gestalt of the 1st - the 3rd operation is attached, and explanation is omitted.

[0157] The configuration of the pachinko machine 24 concerning the gestalt of the 4th operation is

explained using drawing 20 (the 1st example) and drawing 21 (the 2nd example).

[0158] As drawing 20 and drawing 21 show, the pachinko machine 24 concerning the gestalt of the 4th operation is equipped with the sound-collecting microphone 141 which detects an acoustic wave and is changed into an electrical signal. In addition, it is more desirable to use a directive high thing so that this sound-collecting microphone 141 may not catch a surrounding sound as much as possible but only the announcement over a store's public address system and BGM from a loudspeaker 22 may be detected.

[0159] And the sound-collecting microphone 141 judges whether the sound which this microphone detected is more than predetermined sound volume. when it is more than predetermined sound volume, H signal is outputted, and when smaller than predetermined sound volume, it is connected with the sound-volume judging circuit 140 which outputs L signal. The outgoing end of the sound-volume judging circuit 140 is connected with the base of the transistor 142 of an NPN mold through resistance 143. The collector of this transistor 142 is connected with the power source Vcc through resistance 145 while connecting with the input terminal of the silence (noise reduction) demand prepared in CPU60. Moreover, ground connection of the emitter of a transistor 142 is carried out, and resistance 144 intervenes between an emitter and the base.

[0160] CPU60 of drawing 20 concerning the 1st example sets sound-volume attenuation data according to the judgment result (output signal) of the sound-volume judging circuit 140, and, thereby, changes the sound volume of a game sound. Therefore, the configuration from SGC62 to a loudspeaker 28 is the same as usual. On the other hand, CPU60 of drawing 21 concerning the 2nd example is constituted so that an output of a silence (noise reduction) output may be possible, and the output-data line 101 for transmitting this silence (noise reduction) output is formed like drawing 9 of the gestalt (the 2nd example) of the 2nd operation. In addition, the configuration and connection mode from the data line 101 to amplifier 74 are the same as that of drawing 9.

[0161] Next, an operation of the gestalt of the 4th operation is explained. In addition, the main routine is the same as that of the flow chart of drawing 10.

[0162] When it judges with the sound-volume judging circuit 140 being more than sound volume predetermined in the sound volume of the sound detected with the sound-collecting microphone 141, the voltage signal of H level is outputted from the sound-volume judging circuit 140, and a transistor 142 serves as ON. If a transistor 142 operates, a current will flow from a power source Vcc (electrical potential difference of H level) to a ground through resistance 145, and the electrical potential difference of L level will be impressed to the input terminal of CPU60 connected to the lower stream of a river of resistance 145. Thereby, CPU60 detects that the silence (noise reduction) demand was inputted.

[0163] Processing of CPU60 when a silence demand is inputted is the same as that of the flow chart of drawing 11. That is, in the case of the 1st example (drawing 20), in sound processing (step 214 of drawing 10), the return of the predetermined value for reducing a loudness level of sound is added and carried out from the usual attenuator data set in accordance with progress of a musical piece. Moreover, in the case of the 2nd example (drawing 21), in sound processing, the return of the silence (noise reduction) output is set and carried out.

[0164] Moreover, when the sound volume of the sound to which the sound-volume judging circuit 140 was detected with the sound-collecting microphone 141 judges with it being smaller than predetermined sound volume, the voltage signal of L level is outputted from the sound-volume judging circuit 140, and a transistor 142 becomes off. At this time, a current does not flow for resistance 145, but, therefore, the electrical potential difference of H level is impressed to the input terminal of CPU60, and CPU60 detects that a silence (noise reduction) demand is no longer inputted.

[0165] In the case of the 1st example, in sound processing of CPU60 in case such a silence demand is not inputted, a return is carried out promptly, without changing the usual sound data set in accordance with progress of a musical piece. In the case of the 2nd example, a silence (noise reduction) output is not set, but it sets and carries out the return of the usual sound data.

[0166] When the pachinko machine itself judges the sound volume of an announcement over a store's public address system like the gestalt of the 4th operation and an announcement over a store's public address system and BGM become more than predetermined sound volume, it is muffled [sound / of the

pachinko machine 24 / game] (noise reduction), and the effectiveness of becoming easy to catch an announcement over a store's public address system and BGM is acquired.

[0167] In addition, it is also possible to apply the gestalt of the 4th operation to sound processing of the flow chart of drawing 13 . That is, after the sound-volume judging circuit 140 detects predetermined sound volume, processing muffled after predetermined time continuation (noise reduction) is performed. However, since the sound from a loudspeaker 22 changes at any time, its method of determining silence (noise reduction) based on the integral value of the sound volume per unit time amount is desirable. Moreover, it is also possible by using the output from the sound-volume judging circuit 140 directly like the gestalt of the 1st operation, without minding CPU60 to constitute so that it may muffle in hard (noise reduction) (refer to drawing 4 and drawing 5).

(Gestalt of the 5th operation) Next, the gestalt of the 5th operation is explained. In addition, the sign same about the same configuration as the gestalt of each above-mentioned implementation is attached, and detailed explanation is omitted.

[0168] The configuration of the pachinko machine concerning the gestalt of the 5th operation is shown in drawing 22 . The sound-volume judging circuit 140 concerning the gestalt of the 5th operation is equipped with two or more signal lines for outputting the loudness level of sound of the acoustic wave detected with the microphone 141 to CPU60. In the example of drawing 22 , 4-bit sound-volume data (S1, S2, S3, and S4) express a loudness level of sound, and suppose in it that four signal lines are used.

[0169] It is placed between each signal lines which transmit sound-volume data by the same transistor 142 as the gestalt of the 4th operation, and various resistance (143, 144, 145), and the electrical potential difference of each signal line impressed to CPU60 with the output to each signal line from the sound-volume judging circuit 140 is set to L (0) or H (1), respectively. Thereby, CPU60 can detect the detected loudness level of sound with a 4-bit signal.

[0170] Next, the sound processing concerning the gestalt of the 5th operation is explained using the flow chart of drawing 23 . In addition, the main routine is the same as that of the flow chart of drawing 10 . Moreover, the sign same about the same operation part (step) as the flow chart of drawing 18 is attached, and explanation is omitted.

[0171] it is shown in the flow chart of drawing 23 -- as -- first -- CPU60 -- the sound-volume data (S1 --) from the sound-volume judging circuit 140 When S2, S3, and S4 are received (step 330 affirmation judging), The sound-volume attenuation data beforehand defined according to the received sound-volume data (S1, S2, S3, and S4) are added to the usual attenuator data set at step 259 (step 332), and the return of this subroutine is carried out. When not receiving sound-volume data (step 330 negation judging), the return of this subroutine is carried out as it is without changing the set usual attenuator data.

[0172] As the set approach of the sound-volume attenuation data according to the sound-volume data of step 332, there is an approach shown in drawing 24 (a) and (b). In addition, the view of drawing 24 (a) and (b) is the same as the view of drawing 19 (a) of the gestalt of the 3rd operation, and (b).

[0173] In the example of drawing 24 (a), when sound-volume data are = (S1, S2, S3, and S4) (0000), it is regarded as that by which neither an announcement over a store's public address system nor BGM is passed (when the detected loudness level of sound is silent), and considers as sound-volume attenuation data (I1, I2, I3, and I4) = (0000). That is, the loudness level of sound of a game sound is set as max. And it is regarded as that to which the intention of broadcast became strong, and sound-volume attenuation data are changed from (0001) to (1110) as the loudness level of sound corresponding to sound-volume data becomes sound-volume fossete sound-volume size. That is, the loudness level of sound of a game sound is small set up with buildup of the detected loudness level of sound. When sound-volume data become a value (0000) corresponding to the maximum loudness level of sound, sound-volume attenuation data are set as (1111), and a game sound is set to OFF (silence).

[0174] On the contrary, since broadcast can be heard even if a game sound becomes large if the loudness level of sound of an announcement over a store's public address system raises, the view that the loudness level of sound of a game sound can be enlarged with buildup of the loudness level of sound of an announcement over a store's public address system is also made. Drawing 24 (b) showed such an

example, and when sound-volume data are silent level, sound-volume attenuation data are set to (1000) (equivalent to 16dB). And it enlarges [sound / game], and when the detected loudness level of sound becomes max, let sound volume of (0000, i.e., a game sound) be the maximum level for sound-volume attenuation data, as the loudness level of sound corresponding to sound-volume data increases to sound-volume fossete sound-volume size.

[0175] According to the loudness level of sound detected when the pachinko machine itself performed sound control of a game sound like the gestalt of the 5th operation, sound control of a game sound can be performed exactly, and the effectiveness of the ability to make easy to catch an announcement over a store's public address system and BGM is acquired.

[0176] In addition, if sound control of a game sound is performed promptly in response to fluctuation of the detected loudness level of sound, since it may actually be hard coming to catch, it is good to constitute so that attenuator data may be changed into every fixed time amount (for example, 2 seconds). Moreover, since the sound from a loudspeaker 22 changes at any time, its method of determining silence (noise reduction) based on the integral value of the sound volume per unit time amount is desirable.

[0177] although the above is the gestalt of each operation of this invention, it is not limited only to the above-mentioned example and can change into versatility in the range which does not deviate from the summary of this invention.

[0178] For example, although the gestalt of the above 2nd - the 5th implementation showed the processing muffled by adding a predetermined value to the attenuator data set up at any time according to progress of a musical piece (noise reduction), this invention is not limited to this example of processing, and can also perform processing muffled by changing the set attenuator data uniformly for a certain fixed value (noise reduction).

[0179] Moreover, although the sound control system which controls the broadcast sound of a pachinko machine and a pachinko hole was made into the example with the gestalt of each above-mentioned implementation, this invention is not limited to this and can apply this invention also to the sound control system which controls the broadcast sound of the game hole in which other game machine and these game machines, such as a throttle machine, are installed.

[0180]

[Effect of the Invention] As explained above, when a sound control means broadcasts sound information with a broadcast means according to invention of claim 1 and predetermined conditions are satisfied, Since broadcast by the broadcast means and the game sound output by the pachinko machine are interlocked and it was made to control by outputting a silence signal to the pachinko machine installed in the pachinko hole If it corresponds also to BGM while it becomes possible to make broadcast and a game sound easy to catch, even if it uses a certain broadcast means from the former, the effectiveness that the production of the image of the whole store becomes possible easily will be acquired.

[0181] Moreover, since according to invention of claim 2 you make it setting out of a broadcast means interlocked with and it was made to perform sound control of a pachinko machine, the further effectiveness that the sound control system which is easier to use is realizable is acquired.

[0182] Moreover, when the potential of the signal line connected with the source of an external signal is in agreement with predetermined potential according to invention of claim 3, Since silence or the silence circuit which carries out noise reduction was prepared for the game sound by reducing the voltage level of the electrical signal inputted into an output means to a predetermined voltage level While it will become possible to make broadcast and a game sound easy to catch even if it uses a certain broadcast means from the former if you make it a class of broadcast, a loudness level of sound, etc. by a certain broadcast means interlocked with from the former and the potential of the source of an external signal is controlled The effectiveness that the production of the image of the whole store will become possible easily if it corresponds also to BGM is acquired. Moreover, since it is realizable in the easy circuit which consists of combination of a transistor and resistance, it becomes easy [the installation to the pachinko parlor of the pachinko machine by which sound control is carried out in the source of an external signal] very [the above-mentioned silence circuit].

[0183] Moreover, when the silence signal which requires silence or noise reduction of a game sound is

inputted from the outside according to invention of claim 4, changing and outputting the sound data corresponding to the loudness level of sound of the usual game sound to the data corresponding to the loudness level of sound used as silence or noise reduction -- a game sound -- silence -- or, since it was made to carry out noise reduction While it will become possible to make broadcast and a game sound easy to catch even if it uses a certain broadcast means from the former if you make it a class of broadcast, a loudness level of sound, etc. by the broadcast means of the pachinko opportunity exterior interlocked with and a silence signal is inputted from the exterior The effectiveness that the production of the image of the whole store will become possible easily if it corresponds also to BGM is acquired. Moreover, since what is necessary is just to establish a means to change attenuator data by the input of a silence signal, the installation to the pachinko parlor of the pachinko machine by which sound control is carried out becomes very easy.

[0184] Furthermore, according to invention of claim 5, when the input of a silence signal continues beyond fixed time amount, the effectiveness that it is lost silence or that a game sound is muffled of a game sound frequently in response to unprepared microphone actuation etc., and it can prevent a possibility of spoiling a game visitor's interest since noise reduction was made to be carried out is acquired.

[0185] Moreover, since the loudness level of sound of a game sound was changed according to the class of sound information broadcast according to invention of claim 6, finer sound control is attained and the further effectiveness is acquired in respect of the production of the image of the store by the ease of catching, or BGM.

[0186] Furthermore, since the loudness level of sound of a game sound was changed according to the loudness level of sound of the sound information broadcast according to invention of claim 7, finer sound control is attained and the further effectiveness is acquired in respect of the production of the image of the store by the ease of catching, or BGM.

[0187] Moreover, when the sound-volume translation data matched with the loudness level of sound of a game sound is inputted from the outside according to invention of claim 8, Since the loudness level of sound of a game sound was controlled by changing the sound data of the game sound corresponding to the usual loudness level of sound into the sound data of the loudness level of sound corresponding to the sound-volume translation data into which it was inputted If you make it a class of broadcast, a loudness level of sound, etc. by the broadcast means of the pachinko opportunity exterior interlocked with and sound-volume data are inputted from the exterior Even if it uses a certain broadcast means from the former, fine sound control is attained and the further effectiveness is acquired in respect of the production of the image of the store by the ease of catching, or BGM.

[0188] Moreover, since according to invention of claim 9 a pachinko machine is interlocked with an external broadcast sound silence or by carrying out noise reduction and it was made to carry out by the judgment result of the sound-volume judging means with which the pachinko machine itself was equipped sound control of the game sound Even if it uses a certain broadcast means from the former, while it becomes possible to make broadcast and a game sound easy to catch, the effectiveness that the production of the image of the whole store will be attained if it corresponds also to BGM is acquired.

[0189] Furthermore, since it was made to output the game sound of the loudness level of sound defined corresponding to the loudness level of sound of the alien frequencies judged by the sound-volume judging means according to invention of claim 10, finer sound control is attained and the further effectiveness is acquired in respect of the production of the image of the store by the ease of catching, or BGM.

[Translation done.]

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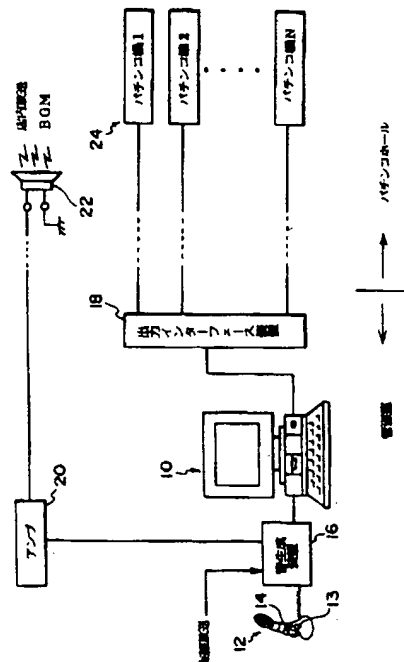
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(54)【発明の名称】 音制御システム及び遊技機

(57)【要約】

【課題】 店内放送やBGMの聞き取りを容易とする。

【解決手段】 店内放送用のマイク１２と、ＢＧＭなどの音信号を出力する音生成装置１６と、音信号を増幅するアンプ２０と、アンプ２０の増幅信号をパチンコホールへ出力するスピーカー２２と、マイクのオンオフの切り替えやボリューム設定、及び音生成装置が出力する音信号の種類や音量レベルを検知し、検知した情報に基づいてパチンコ機の遊技音を消音又は減音するための消音信号を出力するホールコンピュータ１０と、該ホールコンピュータの消音信号をパチンコ機の信号に変換して出力する出力インターフェース装置１８と、から音制御システムを構成する。マイクがオンとされた場合、所定レベル以上にボリューム設定された場合、特定のＢＧＭを放送する場合などに、ホールコンピュータが出力インターフェース装置を介して各パチンコ機へ消音信号を出力する。



【特許請求の範囲】

【請求項1】 遊技状態に応じて遊技音を出力すると共に外部から消音信号が入力されると該遊技音を消音又は減音する遊技機の音制御を行う音制御システムであって、

前記遊技機が設置された遊技ホールに、入力された音情報を放送可能な放送手段と、

前記放送手段により音情報を放送する際に所定条件が成立したとき、前記遊技機へ前記消音信号を出力する音制御手段と、

を有することを特徴とする音制御システム。

【請求項2】 前記音制御手段は、前記放送手段が放送可能な状態に切り替えられた場合、前記放送手段により所定の音情報が放送される場合、及び前記放送手段の出力音の音量レベルが所定の音量レベル以上に設定された場合の少なくともいずれかの場合に、前記所定条件が成立したとみなして前記消音信号を出力することを特徴とする請求項1記載の音制御システム。

【請求項3】 入力された電気信号に基づいて遊技音を出力する出力手段と、

前記出力手段と電気的に接続され、かつ外部信号源と接続された信号線の電位が所定の電位と一致したとき、前記出力手段に入力される電気信号の電圧レベルを所定の電圧レベルまで低下させる作用を有する消音回路と、を含む遊技機。

【請求項4】 入力された電気信号に基づいて遊技音を出力する出力手段と、

遊技音の消音又は減音を要求する消音信号が外部から入力されたとき、通常の遊技音の音量レベルに対応する音データを、消音又は減音となる音量レベルに対応するデータに変換して出力する第1の制御手段と、

前記遊技音の音情報を、前記第1の制御手段が出力した音データに基づく電気信号に変換して前記出力手段に出力する第2の制御手段と、

を含む遊技機。

【請求項5】 前記第1の制御手段は、

前記消音信号の入力が一定時間以上継続したとき、前記音データを、消音又は減音となる音量レベルに対応するデータに変換して出力することを特徴とする請求項4記載の遊技機。

【請求項6】 入力された音量変換データに応じて遊技音の音量レベルを変更する機能を有する遊技機の音制御を行う音制御システムであって、

前記遊技機が設置された遊技ホールに、入力された音情報を放送可能な放送手段と、

前記放送手段により音情報が放送される際に、放送される音情報の種類に従って定められた音量変換データを前記遊技機に出力する音制御手段と、

を有することを特徴とする音制御システム。

【請求項7】 入力された音量変換データに応じて遊技

音の音量レベルを変更する機能を有する遊技機の音制御を行う音制御システムであって、

前記遊技機が設置された遊技ホールに、入力された音情報を放送可能な放送手段と、

前記放送手段により音情報が放送される際に、放送される音情報の音量レベルに応じて定められた音量変換データを前記遊技機に出力する音制御手段と、

を有することを特徴とする音制御システム。

【請求項8】 入力された電気信号に基づいて遊技音を出力する出力手段と、

遊技音の音量レベルに対応づけられる音量変換データが外部から入力されたとき、通常の音量レベルに対応する遊技音の音データを、入力された前記音量変換データに対応した音量レベルの音データに変換して出力する第1の制御手段と、

前記遊技音の音情報を、前記第1の制御手段が出力した音データに基づく電気信号に変換して前記出力手段に出力する第2の制御手段と、

を含む遊技機。

【請求項9】 遊技状態に応じて遊技音を出力する出力手段と、

外部音の音量レベルが所定の音量レベル以上となったか否かを判定する音量判定手段と、

前記音量判定手段により外部音の音量レベルが所定の音量レベル以上であると判定されたとき、前記出力手段により出力される遊技音を消音又は減音する消音手段と、を含む遊技機。

【請求項10】 遊技状態に応じて遊技音を出力する出力手段と、

外部音の音量レベルを判定する音量判定手段と、

前記出力手段により出力される遊技音の音量レベルを、前記音量判定手段により判定された外部音の音量レベルに対応して定められた音量レベルに変更する変更手段と、

を含む遊技機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、音制御システム及び遊技機に係り、詳細には、遊技機、例えばパチンコ機が設置された遊技ホールの放送設備が出力する放送音と遊技機から遊技状態に応じて出力される遊技音とを連動させて出力制御する音制御システム、該音制御システムにより音制御される遊技機、及び外部音に応じて音制御する機能を装置自体に有する遊技機に関する。

【0002】

【従来の技術】従来より、パチンコ店は、複数台のパチンコ機が設置されたパチンコホールにスピーカなどにより音声情報を出力する放送設備を有しており、この放送設備を用いて遊技客に各種の情報を伝達するための店内放送を行ったり、バックグラウンドミュージック（以

下、「BGM」という)を流すことにより店のイメージを演出したりしている。パチンコ店に設置された放送設備は、各パチンコ機を監視するための管理室に設置されたマイクと、CD(コンパクトディスク)等の記録媒体に記録されている音楽を再生出力するプレーヤーと、マイク及びプレーヤーに接続されたパチンコホールのスピーカー(音拡大器)と、から構成される。

【0003】従来では、このような放送設備とパチンコホールのパチンコ機とは、各々別体に構成されており、放送設備による店内放送やBGM等の出力と、パチンコ機が出力する遊技の際の遊技音(例えば、大当たりの際のファンファーレを表す音)の出力とは、互いに無関係に制御されていた。

【0004】しかし、パチンコ機が、装置内部の音情報信号に基づく遊技音しか出力できないこととすると、多種種類の音を出力することが困難となり、遊技客への情報伝達という点で不十分である。

【0005】そこで、特開平8-150242号公報には、管理室に設置されているホールコンピュータ等の外部装置とパチンコ機とを接続し、外部からの音情報信号とパチンコ機内部の音情報信号とを多重にステレオ出力可能なパチンコ機が開示されている。すなわち、外部の音情報としてBGMや店内放送の音情報を設定すれば、従来のようにパチンコホールの天井等に設置されたスピーカーだけからBGMや店内放送が流れるのではなく、パチンコ機のスピーカーからBGMや店内放送が遊技音と共に出力されることになる。

【0006】また、同公報記載の技術によれば、予め定められた優先順位に従って、外部の音情報及び内部の音情報のいずれかが出力されるように音制御する例も挙げられている。例えば、外部情報として音楽が出力されているとき、パチンコ機側で特別図柄等の変動が開始されると、内部情報としての変動音を優先して出力する。また、大当たり中でも、管理室からの緊急情報(例えば、火災報知)がある場合には、その緊急情報を優先して出力する、というものである。

【0007】

【発明が解決しようとする課題】しかしながら、上記公報記載の従来のパチンコ機では、パチンコ機自体に備えられたスピーカから複数の音情報を出力する多重放送の場合に、それぞれの音情報の音量レベルをどのように設定するかという手段が開示されていない。このため、出力される音情報の種類や音量レベルによっては、少なくともいずれかの音情報の聞き取りが困難になるという問題がある。

【0008】また、上記従来技術では、パチンコ機とは別個に設けられた従来の放送設備による店内放送やBGMの音出力と、パチンコ機の音出力との連動が考慮されていない。すなわち、従来技術では、パチンコ機自体のスピーカーから出力される音情報の出力のみを制御の対

象とし、従来の放送設備を同時に用いた場合の音制御については記載がなく、このため、放送設備と併用した場合に生じる音の聞き取りにくさという問題が未解決である。さらに、パチンコ機の小出力のスピーカーだけでBGMなどを流した場合、他のパチンコ機からの音が混ざり合い、BGMにより店全体のイメージを演出するには力不足となる。

【0009】なお、以上のような問題は、パチンコ機を設置しているパチンコホールだけではなく、一般に遊技音を発する遊技機(パチンコ機、スロットマシン等)を使用する遊技ホール等において普遍的に生じる問題である。

【0010】本発明は上記事実を考慮し成されたもので、従来の放送設備を用いて店内放送やBGMを出力した場合に、それらの音を聞き取りやすくした音制御システム及び遊技機を提供することを目的とする。

【0011】

【課題を解決するための手段】上記目的を達成するために、請求項1の発明は、遊技状態に応じて遊技音を出力すると共に外部から消音信号が入力されると該遊技音を消音又は減音する遊技機の音制御を行う音制御システムにおいて、前記遊技機が設置された遊技ホールに、入力された音情報を放送可能な放送手段と、前記放送手段により音情報を放送する際に所定条件が成立したとき、前記遊技機へ前記消音信号を出力する音制御手段と、を有することを特徴とする。

【0012】請求項1の発明では、音制御手段が、放送手段により音情報を放送する際に所定条件が成立したとき、遊技ホールに設置された遊技機へ消音信号を出力する。遊技機は、遊技状態に応じて遊技音を出力すると共に音制御システムから消音信号が入力されると出力していた遊技音を消音(遊技音が消滅)又は減音(遊技音の音量レベルが低下)する。このように本発明では、放送手段による放送と遊技機による遊技音出力とを連動させて制御するので、従来からある放送手段を用いても放送や遊技音が聞き取りやすくすることが可能となると共に、BGMによる店全体のイメージの演出が可能となる。

【0013】また、請求項2の発明のように、請求項1の前記音制御手段が、前記放送手段が放送可能な状態に切り替えられた場合、前記放送手段により所定の音情報が放送される場合、及び前記放送手段の出力音の音量レベルが所定の音量レベル以上に設定された場合の少なくともいずれかの場合に、前記所定条件が成立したとみなして前記消音信号を出力するようにしても良い。

【0014】ここで、放送手段が放送可能な状態となった場合として、例えば、店内放送用のマイク(放送手段に含まれる)の切り替えスイッチをオンに切り替えた場合などがある。また、放送手段により所定の音情報が放送される場合として、例えば、記録媒体などに記録され

た音楽等を出力する音生成装置（放送手段に含まれる）が所定のBGMを放送する場合などがある。また、放送手段の出力音の音量レベルが所定の音量レベル以上に設定された場合として、例えば店内放送用のマイクのボリュームつまみが所定レベル以上に設定された場合や、上記音生成装置のボリュームつまみが所定レベル以上に設定された場合などがある。このように放送手段の設定と連動させて遊技機の音制御を行うことにより、より使いやすいシステムが実現できる。

【0015】また、請求項3の発明は、入力された電気信号に基づいて遊技音を出力する出力手段と、前記出力手段と電氣的に接続され、かつ外部信号源と接続された信号線の電位が所定の電位と一致したとき、前記出力手段に入力される電気信号の電圧レベルを所定の電圧レベルまで低下させる作用を有する消音回路と、を含んで遊技機を構成したものである。

【0016】請求項3の発明では、外部信号源と接続された信号線の電位が所定の電位と一致したとき、消音回路が、出力手段に入力される電気信号の電圧レベルを所定の電圧レベルまで低下させる。なお、出力手段に入力される電気信号の電圧レベルをアースと一致させた場合には、出力手段が出力する遊技音が消音され、出力手段に入力される電気信号の電圧レベルをアースより高いある電圧レベルまで低下させた場合には、出力手段が出力する遊技音の音量レベルが低下して減音される。外部信号源が遊技機外部の放送手段による放送の種類や音量レベルなどと連動させて、信号線の電位を所定の電位と一致するか否かを設定すれば、従来からある放送手段を用いても放送や遊技音が聞き取りやすくすることが可能となると共に、BGMによる店全体のイメージの演出が可能となる。また、上記作用を有する消音回路は、トランジスタと抵抗の組み合わせせからなる簡単な回路で実現できるので、外部信号源により音制御される遊技機の遊技店への導入がきわめて容易となる。

【0017】また、請求項4の発明は、入力された電気信号に基づいて遊技音を出力する出力手段と、遊技音の消音又は減音を要求する消音信号が外部から入力されたとき、通常の遊技音の音量レベルに対応する音データを、消音又は減音となる音量レベルに対応するデータに変換して出力する第1の制御手段と、前記遊技音の音情報を、前記第1の制御手段が出力した音データに基づく電気信号に変換して前記出力手段に出力する第2の制御手段と、を含んで遊技機を構成したものである。

【0018】請求項4の発明では、第1の制御手段が、遊技音の消音又は減音を要求する消音信号が外部から入力されたとき、通常の遊技音の音量レベルに対応する音データを、消音又は減音となる音量レベルに対応するデータに変換して出力する。次に、第2の制御手段が、遊技音の音情報を、第1の制御手段が出力した音データに基づく電気信号に変換して出力手段に出力する。そし

て、出力手段が、消音又は減音された音量レベルで遊技音を出力する。すなわち、本発明は、請求項3の発明がハード的に消音（減音）を行うのに対し、ソフト的に消音（減音）を行うものである。

【0019】本発明においても遊技機外部の放送手段による放送の種類や音量レベルなどと連動させて、外部から消音信号を入力するシステムを設ければ、従来からある放送手段を用いても放送や遊技音が聞き取りやすくすることが可能となると共に、BGMによる店全体のイメージの演出が可能となる。また、ソフト的に消音（減音）を行う本発明でも、第1の制御手段に消音信号が入力される入力端を設けるだけで済み、第2の制御手段などは従来のものを流用できるので、音制御される遊技機の遊技店への導入がきわめて容易となる。

【0020】また、請求項5の発明のように、請求項4の前記第1の制御手段を、前記消音信号の入力が一定時間以上継続したとき、前記音データを、消音又は減音となる音量レベルに対応するデータに変換して出力するように構成しても良い。

【0021】請求項5の発明では、第1の制御手段に消音信号が入力しても直ちに消音又は減音するのではなく、消音信号が一定時間以上継続した場合に消音又は減音する。本発明では、例えば、店内放送やBGMの出力開始時点で、第1の制御手段へ遊技機外部から消音信号を入力するようにすれば、店内放送が一定時間以上継続した後に遊技音が消音又は減音される。これにより、不用意なマイク操作等に度々反応して遊技音が消音されることがなくなり、遊技客の興を損なうおそれを防止できる。

【0022】また、請求項6の発明は、入力された音量変換データに応じて遊技音の音量レベルを変更する機能を有する遊技機の音制御を行う音制御システムにおいて、前記遊技機が設置された遊技ホールに、入力された音情報を放送可能な放送手段と、前記放送手段により音情報が放送される際に、放送される音情報の種類に従って定められた音量変換データを前記遊技機に出力する音制御手段と、を有することを特徴とする。

【0023】請求項6の発明では、音制御手段が、放送手段により放送される音情報の種類に従って定められた音量変換データを遊技機に出力する。そして、遊技機は、入力された音量変換データに応じて遊技音の音量レベルを変更する。このように本発明では、放送される音情報の種類に応じて遊技機の遊技音の音量レベルを変更できるようにしたので、よりきめ細かな音制御が可能となる。例えば、BGMや放送の重要度に応じた遊技音の音量設定ができるという利点がある。また、BGMによる店のイメージ演出（或いは放送による遊技客への警報や通知）と、遊技音による興と、を高いレベルでそれぞれ両立できる。

【0024】ここで、音制御手段は、音量変換データ

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を、例えば遊技機の音量レベルをどの程度に設定すべきかを要求するコマンドとして出力しても良いし、或いは音量レベルをどの程度減衰するかを直接示す音量減衰データとして出力するようにしても良い。

【0025】さらに、請求項7の発明は、入力された音量変換データに応じて遊技音の音量レベルを変更する機能を有する遊技機の音制御を行う音制御システムにおいて、前記遊技機が設置された遊技ホールに、入力された音情報を放送可能な放送手段と、前記放送手段により音情報が放送される際に、放送される音情報の音量レベルに応じて定められた音量変換データを前記遊技機に出力する音制御手段と、を有することを特徴とする。

【0026】請求項7の発明では、音制御手段が、放送手段により音情報が放送される際に、放送される音情報の音量レベルに応じて定められた音量変換データを遊技機に出力する。そして、遊技機は、入力された音量変換データに応じて遊技音の音量レベルを変更する。このように本発明では、放送される音情報の音量レベルに応じて遊技音の音量レベルを変更するようにしたので、よりきめ細かな音制御が可能となる。

【0027】ここで、放送手段により音情報が放送される際に音量レベルを設定する手段として、例えば、上記のマイクや音生成装置の音量レベルを設定するためのボリュームつまみなどがあり、このボリュームつまみに連動させて音量変換データを出力するように本システムを構成することもできる。

【0028】また、請求項8の発明は、入力された電気信号に基づいて遊技音を出力する出力手段と、遊技音の音量レベルに対応づけられる音量変換データが外部から入力されたとき、通常の音量レベルに対応する遊技音の音データを、入力された前記音量変換データに対応した音量レベルの音データに変換して出力する第1の制御手段と、前記遊技音の音情報を、前記第1の制御手段が出力した音データに基づく電気信号に変換して前記出力手段に出力する第2の制御手段と、を含んで遊技機を構成したものである。

【0029】請求項8の発明では、第1の制御手段が、遊技音の音量レベルに対応づけられる音量変換データが外部から入力されたとき、通常の音量レベルに対応する遊技音の音データを、入力された音量変換データに対応した音量レベルの音データに変換して出力する。次に、第2の制御手段が、遊技音の音情報を、第1の制御手段が出力した音データに基づく電気信号に変換して出力手段に出力する。そして、出力手段は、入力された音データに対応する音量レベルの遊技音を出力する。

【0030】本発明では、遊技機外部の放送手段による放送の種類や音量レベルなどと連動させて、外部から音量変換データを入力するシステムを設ければ、従来からある放送手段を用いても、きめの細かい音制御が可能となり、放送や遊技音がさらに聞き取りやすくなることが

可能となる。また、第1の制御手段に音量変換データを入力する入力端を設け、第1の制御手段が該入力端より入力された音声データに基づいて上記のように音データを変換する制御をすれば良く、第2の制御手段などは従来のものを流用できるので、上記のように音制御される遊技機の遊技店への導入がきわめて容易となる。

【0031】また、請求項9の発明は、遊技状態に応じて遊技音を出力する出力手段と、外部音の音量レベルが所定の音量レベル以上となったか否かを判定する音量判定手段と、前記音量判定手段により外部音の音量レベルが所定の音量レベル以上であると判定されたとき、前記出力手段により出力される遊技音を消音又は減音する消音手段と、を含んで遊技機を構成したものである。

【0032】請求項9の発明では、音量判定手段により外部音の音量レベルが所定の音量レベル以上であると判定されたとき、消音手段が、出力手段により出力される遊技音を消音又は減音する。このように本発明では、外部からの信号により遊技音を消音又は減音するのではなく、遊技機に備えられた音量判定手段の判定結果により遊技音を消音又は減音する。この場合においても、遊技機を外部の放送音と連動させて音制御できるので、従来からある放送手段を用いても放送や遊技音が聞き取りやすくなることが可能となると共に、BGMによる店全体のイメージの演出が可能となる。

【0033】さらに、請求項10の発明は、遊技状態に応じて遊技音を出力する出力手段と、外部音の音量レベルを判定する音量判定手段と、前記出力手段により出力される遊技音の音量レベルを、前記音量判定手段により判定された外部音の音量レベルに対応して定められた音量レベルに変更する変更手段と、を含んで遊技機を構成したものである。

【0034】請求項10の発明では、変更手段が、出力手段により出力される遊技音の音量レベルを、音量判定手段により判定された外部音の音量レベルに対応して定められた音量レベルに変更する。これにより、遊技機自体が遊技音を音制御する手段を有する本発明においても、外部音と連動したきめの細かい音制御が可能となる。

【0035】

【発明の実施の形態】以下、図面を参照して本発明の実施の形態に係る音制御システム及び遊技機の1例としてのパチンコ機を説明する。

【0036】（第1の実施の形態）図1には、本発明の第1の実施の形態に係る音制御システムの構成例が示されている。同図が示すように、音制御システムは、パチンコホールに設置された各パチンコ機を管理するためのホールコンピュータ10と、該ホールコンピュータ10からの音制御の指令に基づき各パチンコ機への音制御用の指令信号を出力する出力インターフェース装置18と、音声放送用のマイク12と、与えられた音情報を音

信号（電気信号）として生成する音生成装置16と、該音生成装置16からの音信号を増幅するアンプ20と、パチンコホールの所定位置（例えば天井等）に設置され、かつ該アンプ20の増幅信号を音波に変換して店内放送やBGMとして出力するスピーカー22と、から構成される。

【0037】出力インターフェース装置18には、パチンコホールに設置されたN台のパチンコ機（パチンコ機1、パチンコ機2、...、パチンコ機Nとする）が接続されており、ホールコンピュータ10からの要求出力をパチンコ機1～Nに人力する。

【0038】音生成装置16は、ホールコンピュータ10と接続されており、ホールコンピュータ10からの制御指令に基づいて音信号を出力する。この音生成装置16は、CD（コンパクトディスク）やカセット等の記録媒体に記録されている音情報（BGMなど）を音信号に変換する所謂プレーヤーとして実現することができる。この場合、CDなどを複数枚格納し、ホールコンピュータ10からの指令や与えられたプログラムに従ってCDを順番に再生出力するようにしても良い。

【0039】また、音生成装置16には、マイク12及び有線放送用の端子が接続されており、音生成装置16は、マイク12から入力された音信号や有線放送の音信号をアンプ20を介してスピーカー22より出力させることができる。なお、音生成装置16には、マイク等の各入力音信号に対し、出力オンオフを設定する図示しない選択スイッチが設けられ、該選択スイッチにより出力音信号が選択可能とされている。複数の入力信号をオン設定した場合には、音生成装置16は、これらの音信号を重複して出力する。

【0040】また、マイク12には、マイク入力のオンオフを切り替える切り替えスイッチ14と、入力音声の音量レベルを調節するためのボリュームつまみ13と、が備えられている。

【0041】次に、ホールコンピュータ10の要部の概略構成を図2に示す。同図が示すように、ホールコンピュータ10は、所定のプログラムに従って装置全体を制御・管理するCPU50と、上記プログラムが格納されたROM51と、CPU50の作業域として用いられるRAM52と、磁気記録装置として構成されたハードディスク53と、外部機器とのデータ入出力のインターフェースを制御する入出力インターフェース回路57と、を含んで構成され、各々がコマンドやデータを伝達するバス56と接続されている。

【0042】ハードディスク53には、少なくとも、各パチンコ機の遊技音とスピーカー22からの店内放送・BGMとをどのように連動させて制御するかを示す音制御情報54及び各パチンコ機を管理する際に用いられる管理用データ55が格納されている。CPU50は、これらの情報を適宜RAM52に読み込んで、当該情報に

基づいた制御を行う。

【0043】また、入出力インターフェース回路57には、音生成装置16及び出力インターフェース装置18が接続されている。音生成装置16は、マイク12の切り替えスイッチ14がオン、オフのいずれに設定されているかを示すマイクオンオフ情報、マイク12のボリュームつまみ13がどの音量レベルに設定されているかを示すマイクボリューム設定情報、及び音生成装置がどの状態で音出力を行っているかを識別させる音生成装置制御情報を、入出力インターフェース回路57を介してCPU50に伝達する。そして、CPU50は、入出力インターフェース回路57を介して制御指令を音生成装置16に伝達する。

【0044】なお、上記の音生成装置制御情報として、例えば、記録媒体（以下、CDとして説明する）の音情報、有線放送の音情報、及びマイク12からの音情報のいずれを音生成装置16が出力しているかを示す情報がある。また、CDの音情報を出力している場合、どのCDを再生しているかを示す情報（例えば、曲名に対応するCD番号等）や、再生音量レベル等も含まれる。すなわち、音生成装置16に関連する情報は、すべてホールコンピュータ10の監視下にある。また、上記の制御指令として、例えば、有線放送かCDの再生のいずれを選択するかをの指令（上記選択スイッチで切り替えても良い）、CDの再生出力の開始又は停止の指令、及び複数枚格納されているCDのいずれを再生するかをの指令などがある。

【0045】また、CPU50は、音生成装置制御情報に基づいて店内放送やBGMをパチンコ機の遊技音より優先するか否かを判断し、この判断結果による指令を入出力インターフェース回路57を介して出力インターフェース装置18へ出力する。この指令として、例えば、後述する消音出力又は減音出力（第1、第2の実施の形態）、BGMの種類毎に設定されるコマンド（第3の実施の形態）、及びパチンコ機が出力する遊技音の音量レベル（第3の実施の形態）などがある。

【0046】次に、出力インターフェース装置18の詳細な構成例を図3を用いて説明する。なお、第1の実施の形態では、ホールコンピュータ10は、パチンコ機が出力する遊技音を消音する要求（消音出力1）又は該遊技音を減音する要求（減音出力1）を出力する。

【0047】図3に示すように、出力インターフェース装置18は、パチンコ機1、パチンコ機2、...、パチンコ機Nに各々対応して設けられたリレー40から構成されている。なお、これらのリレーは、復帰状態（コイル非通電状態）で開路し、動作状態（コイル通電状態）で閉路する常時開路型の接点式リレーとして実現したものである。

【0048】各々のリレー40の入力端子には、ホールコンピュータ10からの消音又は減音の出力（以下、要

求1という)を伝達するための信号線41及びホールコンピュータ10のアース(GND)に接続されたアース線42が接続される。また、各々のリレー40の出力端子には、対応するパチンコ機1〜Nへ要求1を入力するための入力信号線43及び各パチンコ機のアース(GND)に接続されたアース線44が接続される。

【0049】パチンコ機の遊技音を消音又は減音しない場合、ホールコンピュータ10は、信号線41をアース接続する。この場合、信号線41の電圧レベルはグラントレレベルとなるので、リレー40は動作せず、よって、人力信号線43とアース線44とが接続していない状態となり、これによりパチンコ機は、ホールコンピュータ10から要求1が出力されていないことを検知することができる。

【0050】これに対し、パチンコ機の遊技音を消音又は減音する場合、ホールコンピュータ10は、信号線41を介して一定の電圧レベルの要求1を出力する。この場合、リレー40が動作し、入力信号線43とアース線44とが接続され、これによりパチンコ機は、ホールコンピュータ10から要求1が出力されたことを検知することが

【0051】次に、パチンコ機24における音制御に関連した部分(音制御系)の回路構成を図4を用いて説明する。

【0052】図4に示すように、パチンコ機24は、パチンコ機の各構成部を制御・管理すると共に、各遊技状態に応じて遊技音の設定周波数と音量レベルの情報を含むデータをデータライン(例えば8ビット)を介して出力するCPU60と、該データラインより受信した受信データに基づいて実際に出力する遊技音の音信号を生成するサウンド・ジェネレーション・コントローラ(SGC)62と、を備えている。また、CPU60は、コントロールラインによりSGC62へのデータの転送のタイミングを制御する。

【0053】SGC62は、遊技音の音色を生成するトーンジェネレータを備えており、このトーンジェネレータは、データラインより受信した受信データから各トーンの周波数を示す周波数データを抽出してトーンカウンタに設定すると共に、受信データから各トーンの音量レベルを示すアッテネータデータを抽出して各トーンのアッテネータカウンタに設定する。SGC62は、トーンカウンタに設定されている周波数データとアッテネータカウンタに設定されているアッテネータデータとにより定められる周波数及び音量レベルの音信号を生成する。

【0054】なお、アッテネータカウンタへ設定されるアッテネータデータは、所定ビット(例えば4ビット)で与えられ、各ビットを複合使用することにより0dB(音量最大)からOFF(消音)まで所定段階(4ビットの場合は例えば16段階)の音量設定が可能となる。ここで、アッテネータデータは、SGC62の最大音量

を基準としたときの減衰量をdB値で示したデータである。すなわち、アッテネータデータのdB値が大きいほど減衰量が大きく、音量が小さくなる。

【0055】さらに、SGC62は、遊技音へ白色性のノイズを重ねさせるためのノイズジェネレータも、備えている。このノイズ音に対してもノイズ音量を示すアッテネータデータが存在する。

【0056】SGC62の出力端には、コンデンサ68の+側極板が接続されており、該コンデンサ68とSGC62の出力端との間は、直列接続されたコンデンサ64及び抵抗66を介してアース接続されている。また、コンデンサ68の-側極板は、直列接続された抵抗70及び抵抗72を介してアース接続されている。

【0057】また、抵抗70及び抵抗72の間は、音信号を増幅するアンプ74の+側入力端子と接続されており、アンプ74の-側入力端子はアース接続されている。アンプ74の出力端は、コンデンサ76を介してパチンコ機の遊技音を出力するスピーカ28の一方の入力端子と接続されている。そして、スピーカ28の他方の入力端子はアース接続されている。なお、このスピーカ28は、図6に示すように、パチンコ機24の遊技盤27を囲む遊技枠29の左右上方部に取り付けられている。

【0058】以上説明した構成部分は、通常の音量レベルの音信号の出力に用いられる構成であるが、第1の実施の形態では、この構成に加えて消音(減音)のために以下のような構成部分(消音構成部)を用意している。

【0059】すなわち、図4に示すように、アンプ74の+側入力端子には、NPN型のトランジスタ80のコレクタが接続されており、このトランジスタ80のベースには、抵抗84を介してPNP型のトランジスタ86のコレクタが接続されている。なお、トランジスタ80のベースとエミッタとは抵抗82を介して接続されている。

【0060】トランジスタ86のエミッタは図示しない電源ブロックから供給される電源 V_{cc} と接続され、トランジスタ86のベースは抵抗90を介して出力インターフェース装置18の入力信号線43と接続されている。そして、トランジスタ86のエミッタとベースとは抵抗88を介して接続されている。なお、出力インターフェース装置18のアース線44は、パチンコ機24の内部でアース接続されている。

【0061】また、ホールコンピュータ10からの要求1により遊技音を減音する場合には、上記のトランジスタ80のコレクタとアンプ74の+側入力端子との間に、抵抗78を介在させる。これに対し、ホールコンピュータ10からの要求1により遊技音を消音する場合には、抵抗78を介在させない。すなわち、上記のトランジスタ80のコレクタを直接にアンプ74の+側入力端子に接続する。

【0062】さらには、抵抗78を可変抵抗器で構成し、0[Ω]も設定できるようにすれば、消音及び任意の消音レベルを設定することが可能である。

【0063】次に、本実施の形態の作用を説明する。所定条件の成立により、ホールコンピュータ10が、出力インターフェース装置18へ消音(減音)の要求1を出力する。すなわち、要求1の信号線41の電圧レベルをグラントレベルから図示しない電源V_{cc}のレベルまで引き上げる。

【0064】ここで、所定条件が成立する場合として、例えば、店員がマイク12のオンオフスイッチ14をオンに切り替えた場合、マイク12のボリュームつまみ13を所定の音量レベル以上までに設定した場合、音生成装置16により生成される音楽が所定の音楽(閉店時の音楽など)になった場合、などが考えられる。これらの場合は、店内放送やBGMをパチンコ機の遊技音に優先する場合に相当している。

【0065】これらの所定条件が成立したか否かは、音生成装置16がホールコンピュータ10へ入力するマイクオンオフ情報、マイクボリューム設定情報、及び音生成装置制御情報などに基づいてホールコンピュータ10のCPU50が判断する。

【0066】要求1が図3の出力インターフェース装置18へ入力されると、リレー40が動作状態となる*
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$$v_1 = r_2 v_0 / (r_1 + r_2) \quad (1)$$

となる。これに対し、トランジスタ80がオン作動したときは、抵抗78が略アース接続され、抵抗72と抵抗78とを並列に接続したものが抵抗70と直列接続され※

$$\begin{aligned} v_2 &= r_1 r_3 v_0 / (r_1 r_2 + r_1 r_3 + r_2 r_3) \\ &= r_2 v_0 / ((r_1 r_2 / r_3) + r_1 + r_2) \end{aligned} \quad (2)$$

となる。

【0070】(1)式と(2)式とを比較すると、(2)式の分母に($r_1 r_2 / r_3$)の項が存在する以外は、分子と分母の他の項は同じである。抵抗値はすべて正であるから、(2)式の分母は常に(1)式の分母より大きくなり、よって $v_1 > v_2$ が常に成立する。すなわち、抵抗78を介在させた場合、トランジスタ80がオン作動すると、オフ時の音信号の電圧レベルより小さい電圧レベルの音信号がアンプ74の+側入力端子に入力され、従って通常の遊技音よりも少ない音量の遊技音がスピーカー28より出力される(減音)。

【0071】一方、要求1が図3の出力インターフェース装置18へ入力されないときは、リレー40が動作せず、入力信号線43とアース線44とが接続されていない状態となるので、トランジスタ86がオフとなる。トランジスタ86がオフの場合、トランジスタ80のベースへは電流が供給されず、トランジスタ80はオフとなる。従って、SGC62から出力された音信号は、消音或いは減音されることなく、アンプ74により増幅され、スピーカー28により通常の音量レベルの遊技音と
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*め、入力信号線43とアース線44とが接続された状態となる。

【0067】この接続状態において、トランジスタ86はオン作動し、その結果トランジスタ80もオンとなる。トランジスタ80のオン作動により、そのコレクタは略アース接続された状態となる。さらには、トランジスタ80のコレクタには、抵抗78が介在されていない場合、アンプ74の入力端子が接続されているため、上記オン作動により、アンプ74の+側入力端子は、略アース接続の状態となる。よって、SGC62から出力された音信号は消滅し、スピーカー28からの遊技音は消音される。

【0068】これに対し、抵抗78が介在されている場合、トランジスタ80のオン作動により、アンプ74の+側入力端子に入力される音信号の電圧が変化する。ここで、音信号の電圧レベルが変化する理由を次に説明する。なお、SGC62からコンデンサ68を介して出力された音信号の電圧レベルを v_0 、抵抗70の抵抗値を r_1 、抵抗72の抵抗値を r_2 、抵抗78の抵抗値を r_3 、アース電位を0とする。

【0069】トランジスタ80がオフのとき、抵抗70と抵抗72とが直列接続されているので、アンプ74の+側入力端子に印加される電圧レベル v_1 は、

※たとみなすことができるので、アンプ74の+側入力端子に印加される電圧レベル v_1 は、

して出力される。

【0072】なお、図3の信号線41及びアース線42は、各パチンコ機に対応して設けられたすべてのリレー40に接続されているので、ホールコンピュータ10からの消音又は減音の要求1が出力インターフェース装置18へ入力されると、直ちに出力インターフェース装置18に接続されているすべてのパチンコ機の遊技音が消音又は減音される。

【0073】以上のように第1の実施の形態では、例えば、店員がマイク12のオンオフスイッチ14をオンに切り替えた場合、マイク12のボリュームつまみ13を所定の音量レベル以上までに設定した場合などのように、店内放送をパチンコ機の遊技音に優先したい場合に、パチンコ機の遊技音が消音又は減音される。これにより、店内放送を聞き取りやすくできると共に、少ない音量でも店内放送が可能となる。

【0074】また、音生成装置16により生成される音楽が所定の音楽(閉店時の音楽など)になった場合などのようにBGMを優先したい場合にも、BGMに対応して消音又は減音ができるので、様々な遊技音が混じり合

うこともなくパチンコ店のイメージ(音)を演出できる。また、BGMの音量を最大にする必要もなくなる。

【0075】また、第1の実施の形態では、図4に示したような簡単な回路構成で上記効果を達成することができる。

【0076】なお、図4の例では、SGC62の出力を消音又は減音するようにしたか、図5に示すように、スピーカー28側で消音又は減音するように構成しても良い。

【0077】図5の構成例では、図4で説明した消音構成部を省略し、その代わりに、アンプ74の出力端に接続されたコンデンサ76を、直列接続された抵抗92及び抵抗94を介してアース接続する。そして、抵抗92と抵抗94との間の点を、スピーカー28の一方の端子に接続すると共にリレー40からの入力信号線43と接続する。なお、出力インターフェース装置18のアース線44は、パチンコ機24の内部でアース接続されている。また、ホールコンピュータ10からの要求1により遊技音を減音する場合には、上記の抵抗92と抵抗94との間の点と入力信号線43との間に、抵抗96を介在させる。これに対し、ホールコンピュータ10からの要求1により遊技音を消音する場合には、抵抗96を介在させない。

【0078】次に、図5の回路の動作を説明する。所定条件の成立により、ホールコンピュータ10からの要求1が出力インターフェース装置18へ入力されると、リレー40が動作状態となるため、入力信号線43とアース線44とが接続された状態となる。この接続状態では、スピーカー28の両端子がアース接続されるので音信号は消滅し、スピーカー28からの遊技音は消音される。

【0079】これに対し、抵抗96が介在されている場合には、上記の(1)、(2)式を用いて説明したのと同様の理由により、アンプ74が出力した音信号の電圧レベルが低下し、スピーカー28から出力される遊技音は減音される。

【0080】このように図5の回路例では、図4の回路よりもさらに簡単な構成で、全く同様の効果を奏することができる。なお、図4においてもトランジスタ86、80を廃止し、図5のようにリレーで直接制御するようにしても良い。

(第2の実施の形態) 次に、第2の実施の形態を説明する。第1の実施の形態は、ハード的に音信号を消音又は減音する場合であったが、パチンコ機のCPUを介してソフト的に音信号を消音又は減音することもできる。これを第2の実施の形態として以下に説明する。なお、第1の実施の形態と同様の構成については同一の符号を付して詳細な説明を省略する。

【0081】図7には、第2の実施の形態に係る出力インターフェース装置18の回路構成が示されている。同

図に示すように、要求1の信号線41を抵抗30を介してNPN型のトランジスタ32のベースに接続し、アース線42をトランジスタ32のエミッタに接続する。そして、抵抗30及びトランジスタ32のベースに挟まれた信号線41とアース線42との間に抵抗31を介在させる。このトランジスタ32と抵抗30、31で構成された構成部分はパチンコ機1〜N毎に用意され、各々か信号線41及びアース線42と接続される。

【0082】さらに、出力インターフェース装置18には、LED37と該LED37の光を検出したときにオンとなるフォトトランジスタ38とから構成されるフォトカプラ36が、パチンコ機1〜N毎に備えられている。フォトカプラ36のLED37のアノード端には、抵抗34を介して電源(Vcc)を供給する電源線45が接続され、LED37のカソード端には対応するトランジスタ32のコレクタが接続される。なお、電源線45はホールコンピュータ10の電源(Vcc)と接続される。

【0083】また、フォトトランジスタ38のコレクタは、対応するパチンコ機の要求1の入力信号線43と接続され、フォトトランジスタ38のエミッタは、対応するパチンコ機のアース線44と接続される。

【0084】パチンコ機の遊技音を消音又は減音しない場合、ホールコンピュータ10は、信号線41をアース接続する。この場合、信号線41の電圧レベルはグランドレベルとなるので、トランジスタ32はオンせず、よって、LED37にも電流が流れず、LED37は発光しない。従って、フォトトランジスタ38はオンせず、信号入力線43とアース線44とは非接続状態となる。

【0085】これに対し、パチンコ機の遊技音を消音又は減音する場合、ホールコンピュータ10は、信号線41を介してHレベルの要求1を出力する。この場合、トランジスタ32がオンとなるので、アノード端が電源Vccに接続されたLED37に電流が流れて発光する。LED37が発光すると、その光を受光したフォトトランジスタ38がオンとなるので、入力信号線43とアース線44とが接続状態となる。

【0086】次に、第2の実施の形態に係るパチンコ機24の回路構成(第1例)を図8を用いて説明する。

【0087】図8に示すように、第2の実施の形態では、要求1を検知するためのデータを入力可能なようにCPU60を構成し、該データの入力のためのデータ線99をCPU60に接続する。そして、データ線99と出力インターフェース装置18からの入力信号線43とを接続し、アース線44をパチンコ機24の内部でアース接続する。さらに、抵抗98を介してデータ線99を電源Vccと接続する。

【0088】ホールコンピュータ10から要求1が入力されると、既に述べたように、フォトトランジスタ38がオンするので、入力信号線43に接続されたデータ線

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99がアース接続され、電源Vccから抵抗98を通してデータ線99を電流が流れる。このとき、CPU60には、フォトトランジスタ38のオン動作の結果、Lレベルの電圧信号が、データ線99を介して入力される。

【0089】一方、ホールコンピュータ10から要求1が入力されない場合は、既に述べたように、フォトトランジスタ38がオンしないので、データ線99には電流が流れず、よってCPU60には、Hレベルの電圧信号が入力される。このようにLレベル及びHレベルのいずれかの信号が入力されたかにより、CPU60はホールコンピュータ10から要求1が入力されたか否かを検知することができる。

【0090】次に、第2の実施の形態に係るパチンコ機24の回路構成(第2例)を図9を用いて説明する。

【0091】図9に示すように、第2の実施の形態の第2例では、データ線99を設けるだけでなく、消音(減音)出力Oを出力可能なようにCPU60を構成し、該消音(減音)出力Oを伝達するための出力データ線101を設ける。なお、消音(減音)出力Oは、Hレベルのときにオン(消音)、Lレベルのときにオフ(消音せず)とする。

【0092】そして、データ線101に抵抗102を介してNPN型のトランジスタ100のベースを接続し、トランジスタ100のエミッタをアース接続すると共にベースとエミッタとを抵抗104を介して接続する。また、トランジスタ100のコレクタを、抵抗70と抵抗72との間に接続する。

【0093】また、遊技音を減音する場合には、上記のトランジスタ100のコレクタと抵抗70及び抵抗72の間の接続点との間に、抵抗106を介在させる。なお、遊技音を消音する場合には、抵抗106を介在させない。

【0094】次に、第2の実施の形態に係るパチンコ機24のメインルーチンを図10のフローチャートを用いて説明する。なお、本メインルーチンは、CPU60において、所定時間(例えば4.0[msec])毎のリセット信号により繰り返し実行される。

【0095】図10のフローチャートに示すように、まず、本パチンコ機24の電源ON初回(電源がONになって初めての処理)、すなわち電源OFF状態から電源ON状態に切り替わった初回であるか否かを判定する(ステップ200)。電源ON初回の場合(ステップ200肯定判定)、本パチンコ機を初期状態とするため、RAM(図示なし)に記憶されたデータを消去(クリア)し(ステップ202)、さらにこれから本メインルーチンを実行するために必要な初期データをRAMにセットし(ステップ204)、次のリセット信号を待機する。

【0096】メインルーチンがスタートしてから4.0[msec]経過後に再度リセットにより本メインルーチン

がステップ200から実行されるが、既に電源が投入されているので、電源ON初回とはならず(ステップ200否定判定)、次の共通処理1を実行する(ステップ206)。この共通処理1では、例えば、図柄表示器などに表示される図柄を決定するための乱数を更新する乱数更新処理等を行う。

【0097】次に、エラー発生中であるか否かを判定し(ステップ208)、エラー発生中であれば(ステップ208肯定判定)、発生したエラーに対処するためのエラー処理を実行し(ステップ210)、ステップ214へ移行する。

【0098】エラー発生中でない場合には(ステップ208否定判定)、パチンコ機24の入賞処理などのゲーム関連処理を実行し(ステップ212)、タイマカウンタを行う(ステップ213)。このタイマカウンタの処理では、上記ステップ212のゲーム関連処理等で設定された各種タイマを本メインルーチン実行毎に(すなわち、リセット信号毎に)減算或いは増算する処理を行う。

【0099】次に、ステップ212のゲーム関連処理で生成される遊技状態(例えば、大当たり状態、権利状態等)に応じて出力する遊技音(大当たり時のファンファーレ音等)のアッテネータデータ及び周波数データをCPU60内部の図示しないレジスタ等に設定するための音処理を実行する(ステップ214)。この音処理の詳細は後述する。なお、ステップ210でエラー処理を行った場合には、エラー音の出力処理も行う。

【0100】そして、CPU60で設定されたアッテネータデータ及び周波数データをSGC62へ出力する(ステップ216)。上述したように、SGC62へ入力されたアッテネータデータ及び周波数データは、SGC62のアッテネータカウンタ及びトーンカウンタへセットされ、セットされたアッテネータデータが示す音量レベル、セットされた周波数データが示す周波数で遊技音の各トーンが生成される。

【0101】そして、共通処理2を実行する(ステップ220)。この共通処理2では、例えば、外部情報出力セット処理、賞球制御処理、表示器制御バッファセット処理、ランプ表示処理、LED表示データセット等の処理を実行する。そして、次のリセット信号を待機し、リセット信号が検出される毎に、ステップ200から上記と同様の処理を実行する。

【0102】次に、図10のステップ214の音処理の詳細を図11のフローチャートを用いて説明する。

【0103】図11のフローチャートに示すように、まず、楽曲の進行に応じた通常の音データをセットする(ステップ230)。この通常の音データは、通常の音量レベルを示すアッテネータデータ及び周波数データからなる。

【0104】次に、ホールコンピュータ10からの消音

(減音)の要求が有るか否か、すなわちCPU60のデータ線99から入力された電圧信号がLレベルであるか否かを判定する(ステップ234)。なお、この要求を表す電圧信号は、所定条件(具体例は第1の実施の形態と同様)が成立したときにホールコンピュータ10から出力される。

【0105】消音(減音)の要求が無い場合、すなわち入力された電圧信号がHレベルの場合(ステップ234否定判定)、本サブルーチンをリターンする。この場合、ステップ234で設定された通常の音量レベルの音データが出力されることになる。

【0106】消音(減音)の要求が有る場合、すなわち入力された電圧信号がLレベルの場合(ステップ234肯定判定)、次の処理を実行する。すなわち、図8の構成例の場合は、アッテネータデータを、減音レベル分加算する(ステップ236の(1))。この加算処理により、アッテネータデータが示す減衰量が減音レベル分、増大するため、ステップ230で設定された音データの音量レベルが減衰される。但し、加算した結果が最大の減衰量データを超えてしまった場合は、最大の減衰量データ(ここでは、オフデータ)をセットする。

【0107】また、楽曲を消音する時は、アッテネータデータにオフデータ(オフレベル)を再セットする。なお、アッテネータデータを消音又は減音用の値に変更する場合、すべてのトーンについてのアッテネータデータと共に、ノイズ音のアッテネータデータも変更する。

【0108】本来のアッテネータデータは楽曲の進行に伴い変化する(音符毎にも変化する)が、ステップ236で減音されたアッテネータデータも本来の変化から一定レベル減音されたレベルで変化する。よって、ステップ236の減音処理によっても楽曲の音色や調子が増減することではなく、音量レベルのみが低下した楽曲が出力される。

【0109】CPU60で設定されたアッテネータデータは、図10のステップ216でSGC62に出力され、SGC62から当該データに基づく音量レベルの音信号が生成されるので、ホールコンピュータ10からの要求により、ソフト的に消音又は減音が可能となる。

【0110】また、図9の構成例の場合、消音(減音)の要求が有ったときに(ステップ234肯定判定)、CPU60が消音(減音)出力をセットする(ステップ236の(2))。すなわち、出力データ線101の電圧レベルをLからHに設定する。このとき、トランジスタ100のベースにHレベルの電圧が印加され、トランジスタ100がオンとなる。よって、抵抗106が介在されていない消音の場合には、アンプ74の+側入力端子がトランジスタ100のコレクタ、エミッタを介してアース接続されるので、音信号が消滅し、スピーカー28から出力される遊技音が消音される。

【0111】一方、抵抗106が介在されている減音の

場合には、抵抗72と抵抗106とが並列接続されるので、第1の実施の形態の(1)、(2)式で説明したのと同様の理由により、アンプ74の+側入力端子に入力される音信号の電圧レベルが低下し、これにより、スピーカー28から出力される遊技音が減音される。

【0112】次に、図12に示すように、ホールコンピュータ10から減音の要求が有った場合(ステップ234肯定判定)、通常よりオクターブを低下させた周波数データをセットしても良い(ステップ240の(3))。これにより、遊技音のオクターブが低下するので、音量レベルを低下させる場合と同様に店内放送やBGMを聞き取りやすくすることが可能となる。

【0113】また、減音用のアッテネータデータをセットする場合や、減音出力をセットする場合と組み合わせで通常よりオクターブの低い周波数データをセットするようにするとさらに効果的である。

【0114】以上の例では、消音(減音)要求の入力があると直ちに遊技音を消音(減音)したが、不用意なマイク操作等に反応して消音(減音)すると、遊技客の興趣を損ねるので、十分に確認してから消音(減音)する必要がある。このような措置を施した音処理の例を図13のフローチャートを用いて説明する。

【0115】図13のフローチャートに示すように、まず、楽曲の進行に応じた通常の音データをセットする(ステップ299)。消音(減音)の要求入力があると(ステップ300肯定判定)、CPU60は消音要求検出フラグが1にセットされているか否かを判定する(ステップ302)。消音要求検出フラグが1にセットされていない場合(ステップ302否定判定)、消音要求検出フラグを1にセットし(ステップ304)、消音要求検出タイマをスタートさせる(ステップ306)。なお、この消音要求検出タイマは、メインルーチンが実行される毎に図10のステップ213で1カウントずつ増算される。すなわち、消音要求検出タイマのカウント値は、消音(減音)の要求がCPU60に入力された時点から経過した時間を示している。

【0116】そして、消音要求検出タイマのカウント値が所定のカウント値Tを越えているか否かを判定する(ステップ308)。なお、消音要求検出フラグが1にセットされている場合は(ステップ302肯定判定)、ステップ304及びステップ306を実行せずに直ちにステップ308に移行する。すなわち、消音要求検出フラグは、消音要求検出タイマが既にスタートされているか否かを示すフラグである。

【0117】消音要求検出タイマのカウント値が所定のカウント値Tを越えている場合(ステップ308肯定判定)、消音継続ダウンタイマをセットする(ステップ310)。この消音継続ダウンタイマは、メインルーチンが実行される毎に図10のステップ213で1カウントずつ減算され、カウント値が0に一致したときに減算

が停止される。また、消音要求入力 T 、時間を超え、一端セットされた後も消音要求入力が継続している間は、ステップ310を通過し初期値に戻る。

【0118】次に、消音継続ダウンタイムが0に一致しているか否かを判定する(ステップ316)。なお、消音要求検出タイマのカウント値が所定のカウンタ値 T を越えていない場合は(ステップ308否定判定)、消音継続ダウンタイムをセットすることなくステップ316を実行する。

【0119】消音継続ダウンタイムが0に一致している場合(ステップ316肯定判定)、直ちに本サブルーチンをリターンする。この場合は、ステップ299でセットされた通常の音量レベルの音データが出力されることになる。

【0120】消音継続ダウンタイムが0に一致していない場合(ステップ316否定判定)、第1例の構成(図8)では、アッテネータデータを減音レベル分加算し(ステップ320の(1))、第2例の構成(図9)では、消音(減音)出力をセットする(ステップ320の(2))。そして、本サブルーチンをリターンする。

【0121】このように図13の音処理では、消音(減音)要求入力がオンとなっても直ちに遊技音が消音(減音)されるのではなく、要求入力がオンとなってから所定時間継続後に(ステップ300における消音要求入力の検出が継続し、その結果、消音要求検出タイマのカウント値が T を越えたとき)遊技音が消音(減音)され、消音継続ダウンタイムが0に一致するまで、この状態が継続される。

【0122】一方、消音(減音)の要求入力が無い場合、若しくは一端要求入力が発生したが、その状態が T 時間以上継続せず消滅してしまった場合(ステップ300否定判定)、消音要求検出フラグをクリアし(ステップ312)、消音要求検出タイマを停止すると共にクリアし(ステップ314)、ステップ316で消音継続ダウンタイムが0に一致しているか否かを判定する。この場合、消音(減音)の要求入力が無くなっても、消音継続ダウンタイムのカウントダウンがまだ実行されている限り、消音(減音)用のアッテネータデータがセット又は消音(減音)出力がセットされる。すなわち、消音(減音)の要求入力をオフとしても暫の間は遊技音が消音(減音)される。

【0123】図13の音処理によれば、一定時間以上、消音要求入力が継続した場合に消音(減音)するようになったので、不用意なマイク操作等に反応して遊技音が消音(減音)されることがなくなり、遊技客の興を損なうのを防止できる。さらに、図13の音処理では、消音中に、消音要求が一定時間以上途切れた場合に消音解除されるので、不用意な消音キャンセルにも反応しない。このように、例えばマイクを頻りにオンオフしても遊技音はダイレクトには反応せず、誤操作に敏感に反応

する場合の放送音の聞き取りにくさを防止できるという利点がある。

【0124】ここで、図13の音処理における消音要求及び音出力のタイムチャートを図25に示す。なお、同図において T_1 は消音要求検出タイマの基準値(消音開始する際の消音要求の最低継続時間)、 T_2 は消音継続ダウンタイムのセット値である。

【0125】図25に示すように、消音要求が一定時間 T_1 経過した時点より、音出力の消音が開始される。消音が開始されてからある時間経過後に、消音要求が一度オフ操作されるか、消音継続ダウンタイムが0にならないうちに再びオン操作されるため、このオフ操作はキャンセルされる。すなわち、不用意な消音キャンセルにパチンコ機が反応していないことがわかる。また、再びオフ操作されてから T_1 時間経過後に音出力がオンとされ、消音状態が消滅する。しかし、この T_1 時間の間に一度消音要求がオン操作されるが、このオン操作は T_1 時間以上継続しないためキャンセルされる。すなわち、不用意な消音要求にパチンコ機が反応していないことがわかる。

【0126】なお、不用意な消音キャンセルに対する余裕時間を α として、 $T_1 = T_0 + \alpha$ (よって $T_0 < T_1$)の関係に T_0 、 T_1 を設定しておくことが望ましい。

【0127】以上のように第2の実施の形態では、ホールコンピュータ10から要求があったとき、CPU60を介してソフト的にパチンコ機の消音(減音)ができることが示された。従って、第2の実施の形態においても、第1の実施の形態と同様の効果を奏することができる。

【0128】なお、第2の実施の形態では、ホールコンピュータ10とパチンコ機24のCPU60とを出力インターフェース装置18を介して接続しているが、第2の実施の形態に係る出力インターフェース装置18(図7)では、フォトカプラ36を介して接続し、直接には電氣的に接続していないので、ノイズ等の悪影響を互いに防止することができる。

(第3の実施の形態)第1及び第2の実施の形態では、ホールコンピュータ10からの要求が、遊技音を消音(減音)するか否かであったが、要求の種類によりさらにきめ細かく遊技音の制御を行うことも可能である。これを第3の実施の形態として以下に説明する。なお、第1及び第2の実施の形態と同様の構成については、同一の符号を付して詳細な説明を省略する。

【0129】図14には、第3の実施の形態に係る出力インターフェース装置18の回路構成が示されている。なお、第3の実施の形態では、3つのデータ I_1 、 I_2 、 I_3 の値(Hレベル又はLレベル)により定まる要求コマンドにより要求の種類を指定する。

【0130】図14に示すように、ホールコンピュータ

10から出力された要求コマンド(1₁, 1₂, 1₃)を伝達するための3つの信号線111, 112, 113とアース線110とが出力インターフェース装置18に接続されている。

【0131】信号線111, 112, 113の各々には、第2の実施の形態に係る出力インターフェース装置の構成(図7)と同様に、NPN型のトランジスタ32とフォトカプラ36と各種の抵抗とからなる切り替え回路が接続されている。すなわち、第3の実施の形態では、パチンコ機1台毎に3つの同じ切り替え回路を用意する。また、パチンコ機1台に対応する各フォトトランジスタ38のコレクタには、1₁, 1₂, 1₃を1台のパチンコ機に入力するための入力信号線121, 122, 123がそれぞれ接続され、さらに各フォトトランジスタ38のエミッタには、当該パチンコ機のグランドレベルに接続されたアース線124が接続されている。

【0132】信号線111, 112, 113は、分岐延長されて他のすべてのパチンコ機毎に各々用意された3つの切り替え回路に各々接続されている。すなわち、ホールコンピュータ10から出力された要求コマンド(1₁, 1₂, 1₃)は、出力インターフェース装置18に接続されているすべてのパチンコ機に伝達される。

【0133】次に、第3の実施の形態に係るパチンコ機24の構成を図15を用いて説明する。同図に示すように、第3の実施の形態では、要求コマンド(1₁, 1₂, 1₃)を入力可能なようにCPU60を構成し、該コマンドデータの入力のための入力データ線128, 129, 130をCPU60に接続する。そして、入力データ線128, 129, 130と出力インターフェース装置18からの入力信号線121, 122, 123とを各々接続し、アース線124をパチンコ機24の内部でアース接続する。さらに、抵抗125, 126, 127を介して入力データ線128, 129, 130を電源Vccと接続する。

【0134】ホールコンピュータ10からの要求コマンド(1₁, 1₂, 1₃)が出力インターフェース装置に入力されると、1₁, 1₂, 1₃がHレベル及びLレベルのいずれであるかにより各切り替え回路のフォトトランジスタ38がオンオフする。オンとなったフォトトランジスタ38に接続された入力データ線は、フォトトランジスタ38がオンとなることによりアース接続され、電源Vccから抵抗(125, 126, 127のいずれか)を通して電流が流れる。このとき、CPU60には、フォトトランジスタ38のオン動作の結果、Lレベルの電圧信号が入力される。

【0135】一方、要求データがLレベルであるため、オフとなったフォトトランジスタ38に接続された入力データ線は、アース電位から切り離されるので、電流が流れず、よって、CPU60には、Hレベルの電圧信号が入力される。

【0136】このようにしてCPU60には、要求コマンド(1₁, 1₂, 1₃)が入力されるが、このコマンドデータは、1₁, 1₂, 1₃がHレベル及びLレベルのいずれであるかの組み合わせによって8通り存在する。CPU60は、入力された要求データが8通りのいずれであるかを判断することによりホールコンピュータ10からの要求の種類を識別することができる。勿論、要求の種類の数に応じて入力データ線の数を変更することも可能である。

10 【0137】次に、第3の実施の形態に係るパチンコ機の音処理を図16のフローチャートを用いて説明する。なお、第3の実施の形態に係るパチンコ機のメインルーチンは、第2の実施の形態と同様であるので、説明を省略する(図10参照)。

【0138】図16のフローチャートに示すように、第3の実施の形態に係るパチンコ機の音処理(図10のステップ214)では、まず、パチンコ機24のCPU60が楽曲の進行に応じた通常の音データをセットする(ステップ249)。次に、ホールコンピュータ10からの要求コマンド(1₁, 1₂, 1₃)が通常モードデータ("H", "H", "H")であるか否かを判定する(ステップ250)。通常モードデータと判定された場合(ステップ252肯定判定)、本サブルーチンをリターンする。即ち、この場合は、通常の音量レベルの遊技音が出力されることになる。

【0139】一方、受信した要求コマンドが通常モード以外のデータと判定された場合(ステップ250否定判定)、受信した要求コマンドに応じて予め定められた音量減衰データがステップ249でセットされたアッテネータデータに加算される(ステップ254)。そして、本サブルーチンをリターンする。

【0140】音量減衰データが加算されたアッテネータデータは、図10のステップ216でSGC62に出力され、通常の音量レベルより、音量減衰データ分だけ音量減衰された遊技音が生成される。

【0141】ここで、ステップ254における、要求コマンドに対応した音量減衰データのセット例を図17を用いてホールコンピュータ10の動作と共に説明する。なお、アッテネータデータ(加算する音量減衰データ)は、4ビットのデータで表現され、各ビットの値により、0dB(音量最大;減衰量無し)~28dB(実施の形態に係る図では24が最大)(音量最小;減衰量最大)までの15段階のいずれかの音量設定(減衰量)又はOFF(消音)が選択される。

【0142】図17に示すように、「放送なし」の場合、ホールコンピュータ10は、要求コマンド(1₁, 1₂, 1₃)として通常モードデータ("H", "H", "H")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして0を加算する。即ち、最初セットされた通常の

アッテネータデータが保持され、遊技音の音量減衰レベルが0dBとなる。放送なしの場合は、当然、遊技音の音量を小さくする必要がないためである。なお、図16のフローチャートでは、通常モードデータ受信時は、音量減衰データの加算処理を行わないことにより、結果的に音量減衰データを0としている。

【0143】また、遊技音優先BGMを流している場合は、ホールコンピュータ10は、要求コマンド("H", "H", "L")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして3を加算する。このとき、遊技音の音量減衰レベルは-6dBとなる。遊技音をある程度優先するため、遊技音の音量の減衰量を小さく抑えたものである。なお、図17の音量減衰レベルは、通常の音量レベルからの減衰量を負のdB値で示したものである。

【0144】さらに、BGM優先BGMを流している場合は、ホールコンピュータ10は、要求コマンド("H", "L", "H")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして10を加算する。このとき遊技音の音量減衰レベルは-20dBとなる。BGMを優先するため、遊技音の音量を小さく抑える必要があるからである。

【0145】さらに、コマーシャルを放送する場合は、ホールコンピュータ10は、要求コマンド("H", "L", "L")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして15を加算する。このとき、遊技音は、減衰ではなく完全に消音(OFF)される。コマーシャルを聞きもらしのないように遊技客に聞かせる必要があるからである。なお、マイク12を用いて放送する場合、放送の種類をホールコンピュータ10に識別させたいときは、オペレータがキーボードやマウス等の入力手段を用いて放送の種類を指定し、指定された放送の種類に応じてホールコンピュータ10が要求コマンドを送出する。

【0146】さらに、大当たりスタート通知の場合、ホールコンピュータ10は、要求コマンド("L", "H", "H")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして5を加算する。このとき、遊技音の音量レベルは-10dBとなる。遊技音及び大当たりスタート通知のいずれも遊技客に聞かせる必要があるからである。

【0147】また、本パチンコ機の打止め通知を放送する場合は、ホールコンピュータ10は、要求コマンド("L", "H", "L")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして15を加算する。このとき、遊技音が完全に消音(OFF)される。打止め通知を聞きもらしのないように遊技客に聞かせる必要があるからである。

【0148】また、閉店通知を放送する場合、ホールコンピュータ10は、要求コマンド("L", "L", "H")を送出する。このコマンドを受信したパチンコ機は、通常のアッテネータデータに音量減衰データとして12を加算する。このとき、遊技音の音量レベルは-24dBとなる。閉店の時間であることを遊技客に確実に知らせる必要があるからである。

【0149】なお、第3の実施の形態は、図17の例に限定されるものではなく、任意好適に変更可能である。

【0150】以上の例では、要求コマンドに応じてアッテネータデータに加算される音量減衰データが設定されたが、逆に音量減衰データそのものをホールコンピュータ10から直接指示しても良い。この場合、アッテネータデータに対応して音量減衰データが4ビットのとき、各ビットの情報を送出するため、ホールコンピュータからパチンコ機へ入力するデータとして(1, 1, 1, 1)が必要となる。この場合、図14、図15において、入力信号線を4本に変更すると共に、トランジスタ32とフォトカプラ36と各種の抵抗とからなる切り替え回路も1台のパチンコ機について4個ずつ設ける(図示しない)。

【0151】次に、上記のように4ビットの音量減衰データを送出することにより遊技音の音量制御を行う場合のパチンコ機側の音処理を図18のフローチャートを用いて説明する。

【0152】図18のフローチャートに示すように、まず、楽曲の進行に応じた通常の音データをセットする(ステップ259)。ここで、音量減衰データを受信しない場合は(ステップ260否定判定)、本サブルーチンをリターンする。この場合は、通常の音量レベルの遊技音が生成されることになる。

【0153】音量減衰データを受信した場合(ステップ260肯定判定)、受信した音量減衰データを通常のアッテネータデータに加算し(ステップ264)、本サブルーチンをリターンする。なお、ホールコンピュータ10側は、図17に示すように、放送やBGMの種類毎に定められた音量減衰データを送信する。また、これ以外の例として、例えば、図19(a)、図19(b)の表に示したように、マイク12のボリュームつまみ14の設定レベルに連動した音量減衰データを送出するようにしても良い。

【0154】図19(a)の例では、マイク12がオフとされているとき、放送をしないものとみなして、音量減衰データ(1, 1, 1, 1)=(0000)とする。すなわち、遊技音の音量レベルを最大に設定する。なお、図19の各表の音量減衰データの各ビットは、「0」又は「1」で表現しているが、「0」がLレベルに対応し、「1」がHレベルに対応している。そして、マイクボリューム設定が、音量小から音量大になるに従い、放送の意思が強くなったものとみなして送出す

る音量減衰データを(0001)から(1110)まで変化させる。すなわち、マイクボリュームの増大と共に遊技音の音量レベルを小さく設定する。マイクボリューム設定が最大となったとき、音量減衰データを(1111)に設定し、遊技音をOFFとさせる(消音)。

【0155】逆に、マイクボリュームを上げれば、遊技音が大きくなって放送が聞こえるので、マイクボリュームの増大と共に遊技音の音量レベルを大きくできるという考え方もできる。このような例を示したのが図19(b)であり、マイクボリューム設定がOFFのとき、音量減衰データを(1000)とする(遊技音の音量レベルが16dBに相当)。この場合、放送をしないので、当然、遊技音の消音はしない。そして、マイクボリュームが音量小から音量大まで増大するにつれ、遊技音を大きくさせ、マイクボリュームが最大となったとき、音量減衰データを(0000)、すなわち遊技音の音量を最大レベルとする。

【0156】以上のように第3の実施の形態では、図17に示したように、放送やBGMの音種類や音量レベルに連動させて、パチンコ機の遊技音を様々な音量レベルに設定するようにした。これにより、第1及び第2の実施の形態と比較して、よりきめ細かな音制御が可能となった。例えば、BGMや放送の重要度に応じた遊技音の音量設定ができるという利点がある。また、遊技音による興趣とBGMによる店のイメージ演出と共に、遊技音による興趣と放送による遊技客への取り仕切りと、を高いレベルでそれぞれ両立できる。

(第4の実施の形態)第1～第3の実施の形態では、パチンコ機がホールコンピュータからの信号により音制御されたが、パチンコ機自体が音制御しても良い。これを第4の実施の形態として以下に説明する。なお、第1～第3の実施の形態と同様の構成については同一の符号を付して説明を省略する。

【0157】第4の実施の形態に係るパチンコ機24の構成を図20(第1例)及び図21(第2例)を用いて説明する。

【0158】図20及び図21が示すように、第4の実施の形態に係るパチンコ機24には、音波を検出して電気信号に変換する集音マイク141が備えられている。なお、この集音マイク141は、可能な限り周囲の音をキャッチせず、スピーカー22からの店内放送やBGMのみを検出するように指向性の高いものを用いた方が好ましい。

【0159】そして、集音マイク141は、このマイクが検出した音が所定の音量以上であるか否かを判定し、所定の音量以上である場合はH信号を出力し、所定の音量より小さい場合はL信号を出力する音量判定回路140と接続されている。音量判定回路140の出力端は、抵抗143を介してNPN型のトランジスタ142のベースと接続されている。このトランジスタ142のコレ

クタは、CPU60に設けられた消音(減音)要求の入力端子と接続されると共に、抵抗145を介して電源Vccと接続されている。また、トランジスタ142のエミッタはアース接続され、エミッタとベースとの間には抵抗144が介在されている。

【0160】第1例に係る図20のCPU60は、音量判定回路140の判定結果(出力信号)に応じて音量減衰データをセットし、これにより遊技音の音量を変更する。従って、SGC62からスピーカー28までの構成は、従来と同様である。これに対し、第2例に係る図21のCPU60は、消音(減音)出力を出力可能なように構成されており、第2の実施の形態(第2例)の図9と同様に、該消音(減音)出力を伝達するための出力データ線101が設けられている。なお、データ線101からアンプ74までの構成及び接続様子は、図9と同様である。

【0161】次に、第4の実施の形態の作用を説明する。なお、メインルーチンは、図10のフローチャートと同様である。

【0162】音量判定回路140が、集音マイク141により検出された音の音量が所定の音量以上であると判定した場合、音量判定回路140からHレベルの電圧信号が出力され、トランジスタ142がオンとなる。トランジスタ142が作動すると、電源Vcc(Hレベルの電圧)から抵抗145を介してアースまで電流が流れ、抵抗145の下流に接続されたCPU60の入力端子には、Lレベルの電圧が印加される。これにより、CPU60は、消音(減音)要求が入力されたことを検知する。

【0163】消音要求が入力された場合のCPU60の処理は、図11のフローチャートと同様である。すなわち、第1例(図20)の場合は、音処理(図10のステップ214)において、楽曲の進行に沿ってセットされた通常のアッテネータデータから音量レベルを低下させるための所定値を加算してリターンする。また、第2例の場合(図21)は、音処理において、消音(減音)出力をセットしてリターンする。

【0164】また、音量判定回路140が、集音マイク141により検出された音の音量が所定の音量より小さいと判定した場合、音量判定回路140からLレベルの電圧信号が出力され、トランジスタ142がオフとなる。このとき、抵抗145には電流が流れず、よってCPU60の入力端子には、Hレベルの電圧が印加され、CPU60は、消音(減音)要求が入力されなくなったことを検知する。

【0165】このような消音要求が入力されない場合のCPU60の音処理では、第1例の場合、楽曲の進行に沿ってセットされた通常音データを変更することなく直ちにリターンする。第2例の場合は、消音(減音)出力をセットせず、通常音データをセットしてリターン

する。

【0166】第4の実施の形態のようにパチンコ機自体が店内放送の音量を判定する場合においても、店内放送及びBGMが所定の音量以上となったとき、パチンコ機24の遊技音が消音(減音)され、店内放送やBGMが聞き取りやすくなる、という効果が得られる。

【0167】なお、第4の実施の形態を図13のフローチャートの音処理に適用することも可能である。すなわち、音量判定回路140が所定の音量を検出してから所定時間継続後に消音(減音)する処理を行う。但し、スピーカ22からの音は随時変化してしまうので、単位時間当たりの音量の積分値に基づいて消音(減音)を決定する方法が望ましい。また、第1の実施の形態のように、音量判定回路140からの出力をCPU60を介さずに直接用いることにより、ハード的に消音(減音)するように構成することも可能である(図4、図5参照)。

(第5の実施の形態)次に、第5の実施の形態を説明する。なお、上記各実施の形態と同様の構成については同一の符号を付して詳細な説明を省略する。

【0168】図22には、第5の実施の形態に係るパチンコ機の構成が示されている。第5の実施の形態に係る音量判定回路140は、マイク141により検出した音波の音量レベルをCPU60に出力するための複数の信号線を備えている。図22の例では、音量レベルを4ビットの音量データ(S_1, S_2, S_3, S_4)で表し、4本の信号線を用いることとする。

【0169】音量データを伝達する各信号線には、第4の実施の形態と同様のトランジスタ142及び各種抵抗(143、144、145)が介在されており、音量判定回路140からの各信号線への出力によりCPU60へ印加される各信号線の電圧がそれぞれL(0)又はH(1)となる。これにより、CPU60は、検出された音量レベルを4ビットの信号により検知することができる。

【0170】次に、第5の実施の形態に係る音処理を図23のフローチャートを用いて説明する。なお、メインルーチンは図10のフローチャートと同様である。また、図18のフローチャートと同様の作用部分(ステップ)については同一の符号を付して説明を省略する。

【0171】図23のフローチャートに示すように、まず、CPU60が音量判定回路140からの音量データ(S_1, S_2, S_3, S_4)を受信した場合(ステップ330肯定判定)、受信した音量データ(S_1, S_2, S_3, S_4)に応じて予め定められた音量減衰データをステップ259でセットされた通常のアッテネータデータに加算し(ステップ332)、本サブルーチンをリターンする。音量データを受信しない場合(ステップ330否定判定)は、セットされた通常のアッテネータデータを変更しないでそのまま本サブルーチンをリターンす

る。

【0172】ステップ332の音量データに応じた音量減衰データのセット方法として、例えば、図24

(a)、(b)に示した方法がある。なお、図24

(a)、(b)の考え方は、第3の実施の形態の図19(a)、(b)の考え方と同様である。

【0173】図24(a)の例では、音量データが(S_1, S_2, S_3, S_4)=(0000)の場合(検出した音量レベルが無音の場合)、店内放送やBGMが流されていないものとみなして、音量減衰データ(I_1, I_2, I_3, I_4)=(0000)とする。すなわち、遊技音の音量レベルを最大に設定する。そして、音量データに対応する音量レベルが、音量小から音量大になるに従い、放送の意思が強くなったものとみなして、音量減衰データを(0001)から(1110)まで変化させる。すなわち、検出した音量レベルの増大と共に遊技音の音量レベルを小さく設定する。音量データが最大音量レベルに対応する値(0000)となったとき、音量減衰データを(1111)に設定し、遊技音をOFFとさせる(消音)。

【0174】逆に、店内放送の音量レベルが上げれば、遊技音が大きくなっても放送が聞こえるので、店内放送の音量レベルの増大と共に遊技音の音量レベルを大きくできるという考え方もできる。このような例を示したのが図24(b)であり、音量データが無音レベルのとき、音量減衰データを(1000)とする(16dBに相当)。そして、音量データに対応する音量レベルが音量小から音量大まで増大するにつれ、遊技音を大きくさせ、検出された音量レベルが最大となったとき、音量減衰データを(0000)、すなわち遊技音の音量を最大レベルとする。

【0175】第5の実施の形態のようにパチンコ機自体が遊技音の音制御を行う場合においても、検出した音量レベルに応じて遊技音の音制御を的確に行うことができ、店内放送やBGMを聞き取りやすくなる、という効果が得られる。

【0176】なお、検出した音量レベルの変動に直ちに反応して遊技音の音制御を行うと、かえって聞き取りにくくなる場合があるので、一定時間(例えば、2秒)毎にアッテネータデータを変更するように構成すると良い。また、スピーカ22からの音は随時変化してしまうので、単位時間当たりの音量の積分値に基づいて消音(減音)を決定する方法が望ましい。

【0177】以上が本発明の各実施の形態であるが、上記例にのみ限定されるものではなく、本発明の要旨を逸脱しない範囲において種々に変更可能である。

【0178】例えば、上記第2～第5の実施の形態では、楽曲の進行に合わせて随時設定されるアッテネータデータに対し所定値を加算することにより消音(減音)する処理を示したが、本発明は、この処理例に限定され

るものではなく、セットされたアッテネータデータである一定の値に一律に変更することにより消音（減音）する処理を行うこともできる。

【0179】また、上記各実施の形態では、パチンコ機及びパチンコホールの放送音を制御する音制御システムを例にしたが、本発明は、これに限定されるものではなく、例えばスロットマシンなどのような他の遊技機、及び該遊技機が設置されている遊技ホールの放送音を制御する音制御システムにも本発明を適用することができる。

【0180】

【発明の効果】以上説明したように、請求項1の発明によれば、音制御手段が、放送手段により音情報を放送する際に所定条件が成立したとき、パチンコホールに設置されたパチンコ機へ消音信号を出力することにより、放送手段による放送とパチンコ機による遊技音出力とを連動させて制御するようにしたので、従来からある放送手段を用いても放送や遊技音が聞き取りやすくなることが可能となると共に、BGMにも対応すれば、店全体のイメージの演出が容易に可能となる、という効果が得られる。

【0181】また、請求項2の発明によれば、放送手段の設定と連動させてパチンコ機の音制御を行うようにしたので、より使いやすい音制御システムが実現できる、というさらなる効果が得られる。

【0182】また、請求項3の発明によれば、外部信号源と接続された信号線の電位が所定の電位と一致したとき、出力手段に入力される電気信号の電圧レベルを所定の電圧レベルまで低下させることにより遊技音を消音又は減音させる消音回路を設けたので、従来からある放送手段による放送の種類や音量レベルなどと連動させて外部信号源の電位を制御すれば、従来からある放送手段を用いても放送や遊技音が聞き取りやすくなることが可能となると共に、BGMにも対応すれば店全体のイメージの演出が容易に可能となる、という効果が得られる。また、上記の消音回路は、トランジスタと抵抗の組み合わせからなる簡単な回路で実現できるので、外部信号源により音制御されるパチンコ機のパチンコ店への導入がきわめて容易となる。

【0183】また、請求項4の発明によれば、遊技音の消音又は減音を要求する消音信号が外部から入力されたとき、通常の遊技音の音量レベルに対応する音データを、消音又は減音となる音量レベルに対応するデータに変換して出力することにより、遊技音を消音又は減音するようにしたので、パチンコ機外部の放送手段による放送の種類や音量レベルなどと連動させて、外部から消音信号を入力するようになれば、従来からある放送手段を用いても放送や遊技音が聞き取りやすくなることが可能となると共に、BGMにも対応すれば店全体のイメージの演出が容易に可能となる、という効果が得られる。ま

た、消音信号の入力によりアッテネータデータを変換する手段を設ければ良いので、音制御されるパチンコ機のパチンコ店への導入がきわめて容易となる。

【0184】さらに、請求項5の発明によれば、消音信号の入力が一定時間以上継続したときに、遊技音が消音又は減音されるようにしたので、不用意なマイク操作等に度々反応して遊技音が消音されることが無くなり、遊技客の興を損なうおそれを防止できる、という効果が得られる。

10 【0185】また、請求項6の発明によれば、放送される音情報の種類に応じて遊技音の音量レベルを変更するようにしたので、よりきめ細かな音制御が可能となり、聞き取りやすさやBGMによる店のイメージの演出という点でさらなる効果が得られる。

【0186】さらに、請求項7の発明によれば、放送される音情報の音量レベルに応じて遊技音の音量レベルを変更するようにしたので、よりきめ細かな音制御が可能となり、聞き取りやすさやBGMによる店のイメージの演出という点でさらなる効果が得られる。

20 【0187】また、請求項8の発明によれば、遊技音の音量レベルに対応づけられる音量変換データが外部から入力されたとき、通常の音量レベルに対応する遊技音の音データを、入力された音量変換データに対応した音量レベルの音データに変換することにより、遊技音の音量レベルを制御するようにしたので、パチンコ機外部の放送手段による放送の種類や音量レベルなどと連動させて、外部から音量データを入力するようになれば、従来からある放送手段を用いても、きめの細かい音制御が可能となり、聞き取りやすさやBGMによる店のイメージの演出という点でさらなる効果が得られる。

30 【0188】また、請求項9の発明によれば、パチンコ機自体に備えられた音量判定手段の判定結果により遊技音を消音又は減音することにより、パチンコ機を外部の放送音と連動させて音制御できるようにしたので、従来からある放送手段を用いても放送や遊技音が聞き取りやすくなることが可能となると共に、BGMにも対応すれば店全体のイメージの演出が可能となる、という効果が得られる。

【0189】さらに、請求項10の発明によれば、音量判定手段により判定された外部音の音量レベルに対応して定められた音量レベルの遊技音を出力するようにしたので、よりきめ細かな音制御が可能となり、聞き取りやすさやBGMによる店のイメージの演出という点でさらなる効果が得られる。

【図面の簡単な説明】

【図1】本発明の音制御システムの外観構成を示すブロック図である。

【図2】本発明の音制御システムの詳細な構成を示すブロック図である。

【図3】本発明の第1の実施の形態に係る出力インター

フェース装置の詳細な回路構成を示す図である。

【図4】本発明の第1の実施の形態に係るパチンコ機の詳細な回路構成（第1例）を示す図である。

【図5】本発明の第1の実施の形態に係るパチンコ機の詳細な回路構成（第2例）を示す図である。

【図6】本発明に係るパチンコ機の正面図である。

【図7】本発明の第2の実施の形態に係る出力インターフェース装置の詳細な回路構成を示す図である。

【図8】本発明の第2の実施の形態に係るパチンコ機の詳細な回路構成（第1例）を示す図である。

【図9】本発明の第2の実施の形態に係るパチンコ機の詳細な回路構成（第2例）を示す図である。

【図10】本発明の第2の実施の形態に係るパチンコ機のメインルーチンを示すフローチャートである。

【図11】本発明の第2の実施の形態に係るパチンコ機の音処理の流れを示すフローチャートである。

【図12】本発明の第2の実施の形態に係るパチンコ機の音処理の流れを示すフローチャートである。

【図13】本発明の第2の実施の形態に係るパチンコ機の音処理（消音要求の継続時間の判定有りの場合）の流れを示すフローチャートである。

【図14】本発明の第3の実施の形態に係る出力インターフェース装置の詳細な回路構成を示す図である。

【図15】本発明の第3の実施の形態に係るパチンコ機の詳細な回路構成を示す図である。

【図16】本発明の第3の実施の形態に係るパチンコ機の音処理（要求コマンド対応）の流れを示すフローチャートである。

【図17】本発明の第3の実施の形態に係るパチンコ機の音処理において、受信した要求コマンドと、該コマンドに応じて設定される遊技音の音量減衰レベル（アッテネータレベル）との対応関係を示す表である。

【図18】本発明の第3の実施の形態に係るパチンコ機の音処理（アッテネータデータ対応）の流れを示すフローチャートである。

【図19】本発明の第3の実施の形態に係るホールコン*

*コンピュータが、マイクボリュームの設定に応じて図18の音処理を実行するパチンコ機へ送出するアッテネータデータの具体例を示す表であって、（a）はマイクボリュームが音量大となるに従って遊技音を小さくする場合の表、（b）はマイクボリュームが音量大となるに従って遊技音を大きくする場合の表である。

【図20】本発明の第4の実施の形態に係るパチンコ機の詳細な回路構成（第1例）を示す図である。

【図21】本発明の第4の実施の形態に係るパチンコ機の詳細な回路構成（第2例）を示す図である。

【図22】本発明の第5の実施の形態に係るパチンコ機の詳細な回路構成を示す図である。

【図23】本発明の第5の実施の形態に係るパチンコ機の音処理の流れを示すフローチャートである。

【図24】本発明の第5の実施の形態に係るパチンコ機の音量判定回路が出力した音量データと、セットされるアッテネータデータとの対応関係を示す表であって、

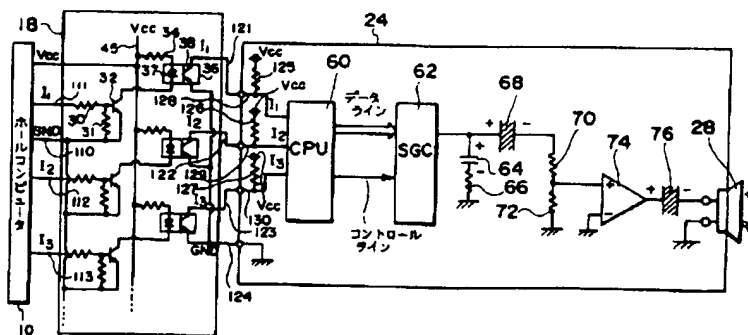
（a）は音量データに対応する音量が大きくなるに従って遊技音を小さくする場合の表、（b）は音量データに対応する音量が大きくなるに従って遊技音を大きくする場合の表である。

【図25】本発明の第2の実施の形態に係るパチンコ機の音処理（消音要求の継続時間の判定有りの場合）における消音要求と音出力とのタイムチャートである。

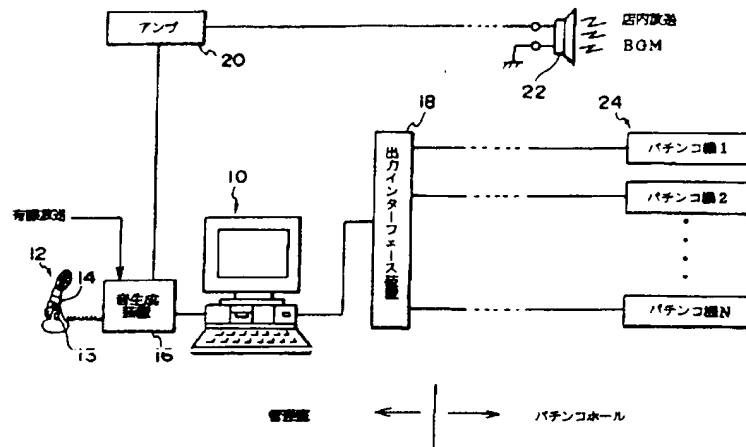
【符号の説明】

10	ホールコンピュータ
12	マイク
13	ボリュームつまみ
14	切り替えスイッチ
16	音生成装置
18	出力インターフェース装置
22	スピーカー
24	パチンコ機
28	スピーカー
60	CPU
62	SGC

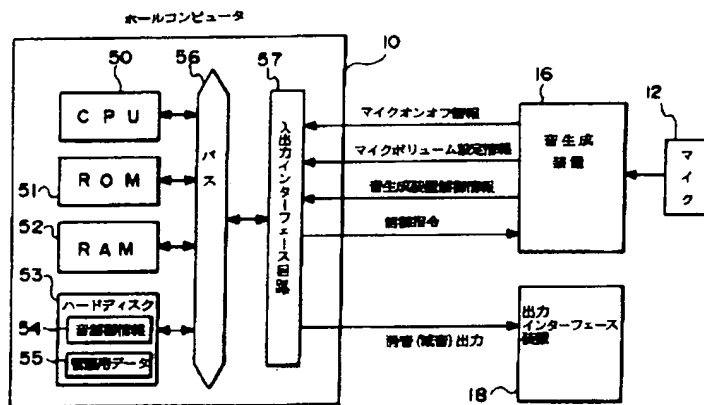
【図15】



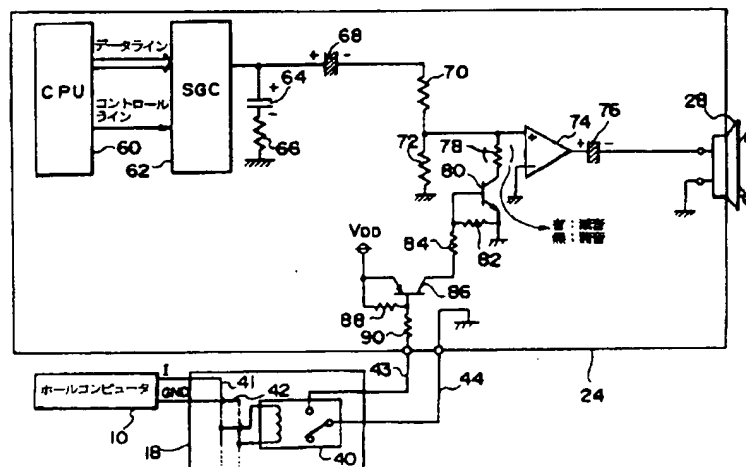
【図1】



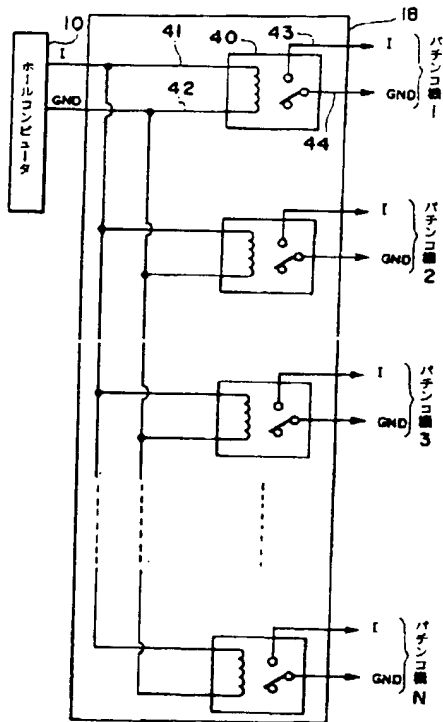
【図2】



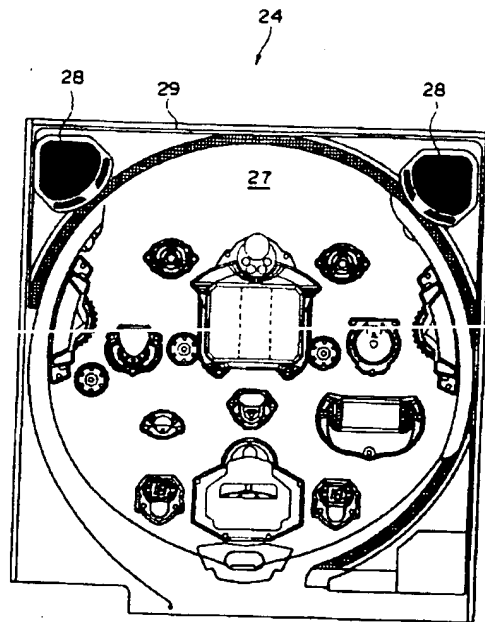
【図4】



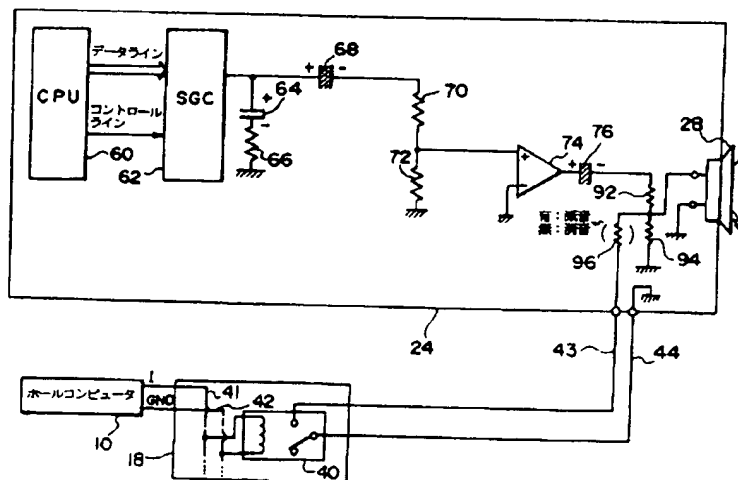
【図3】



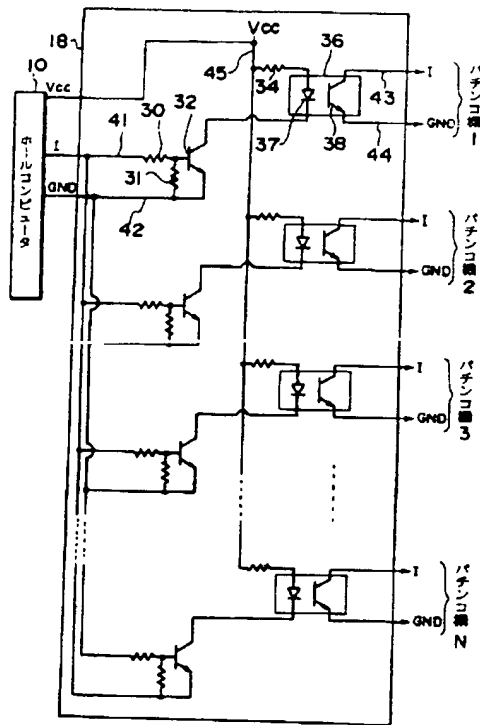
【図6】



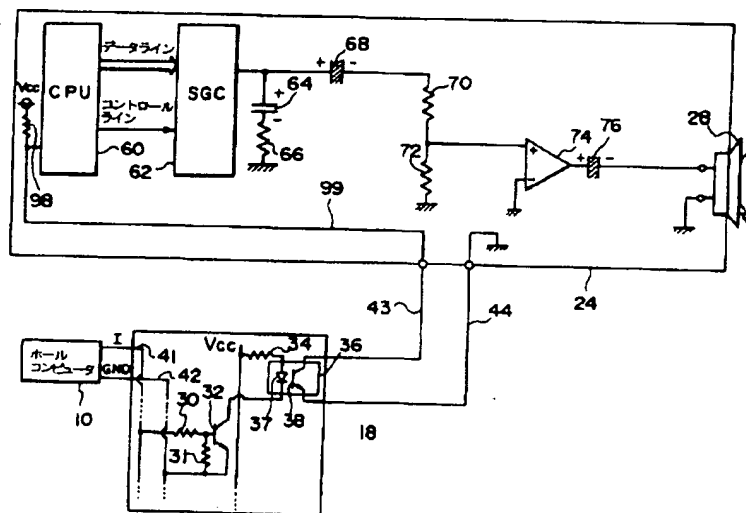
【図5】



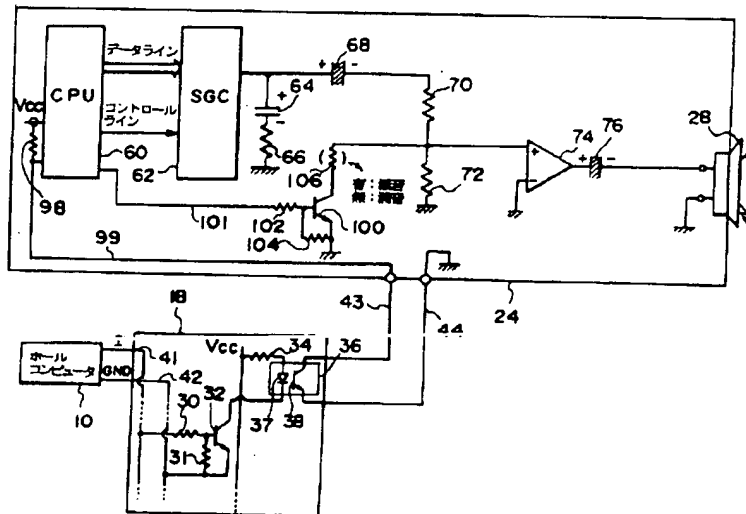
【図7】



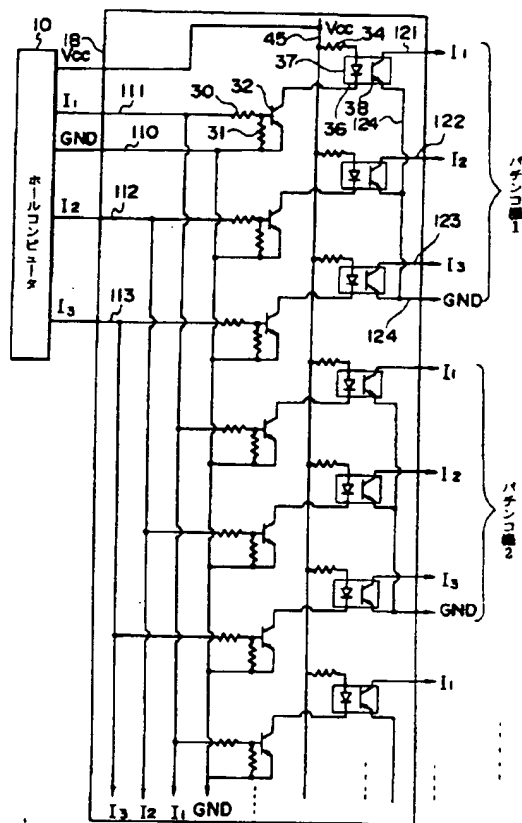
【図8】



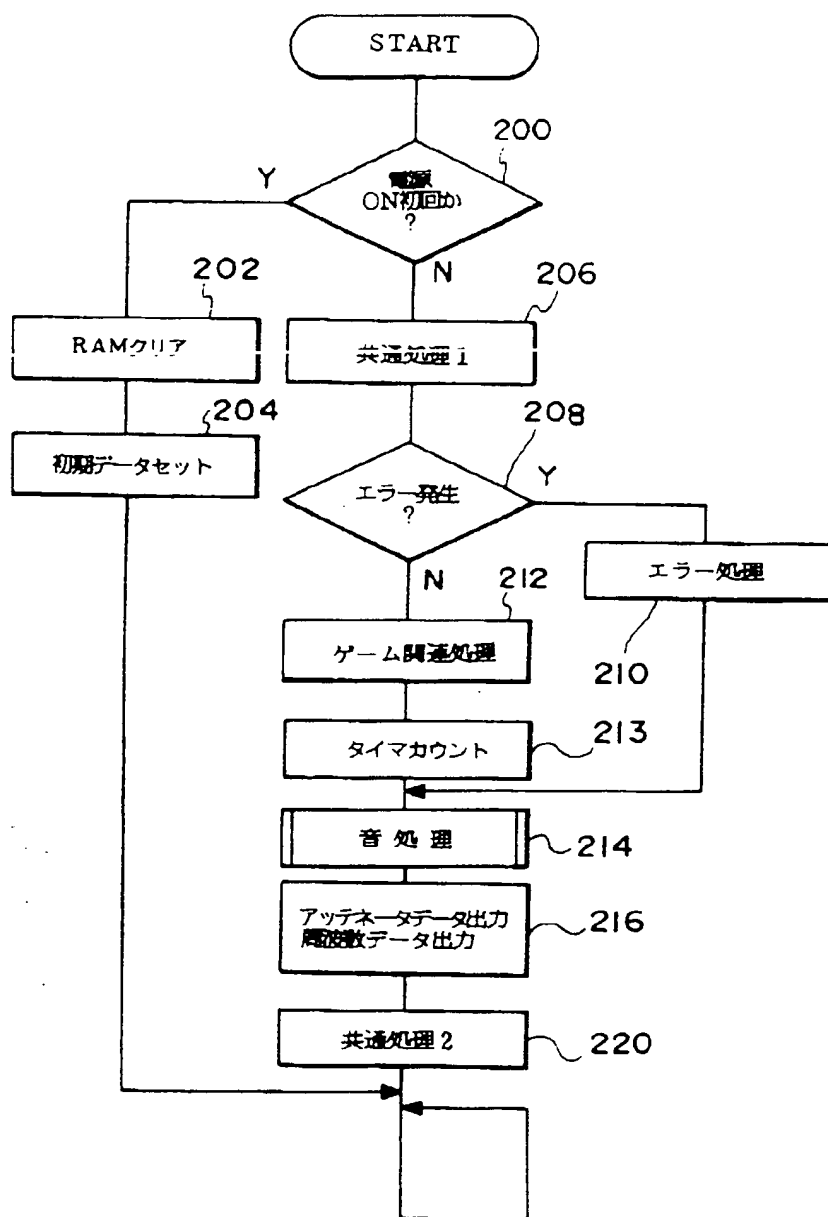
【図9】



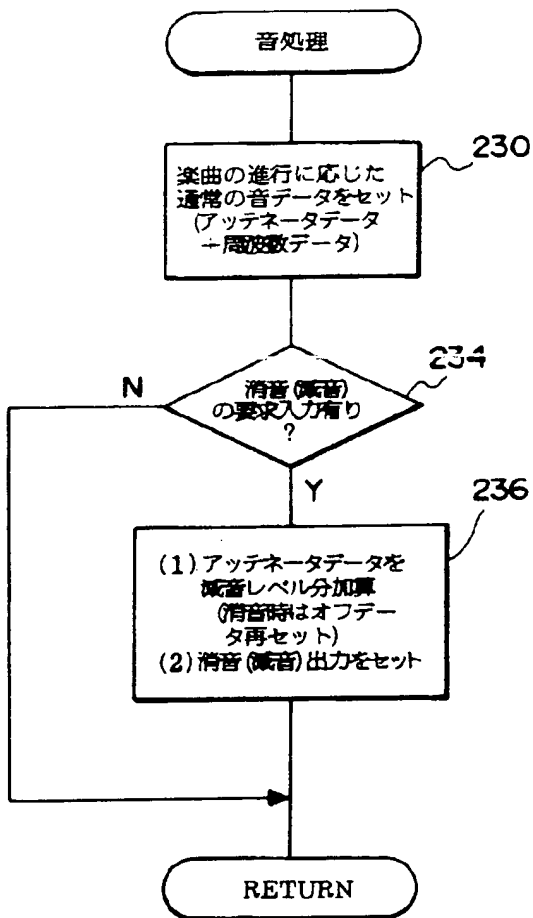
【図14】



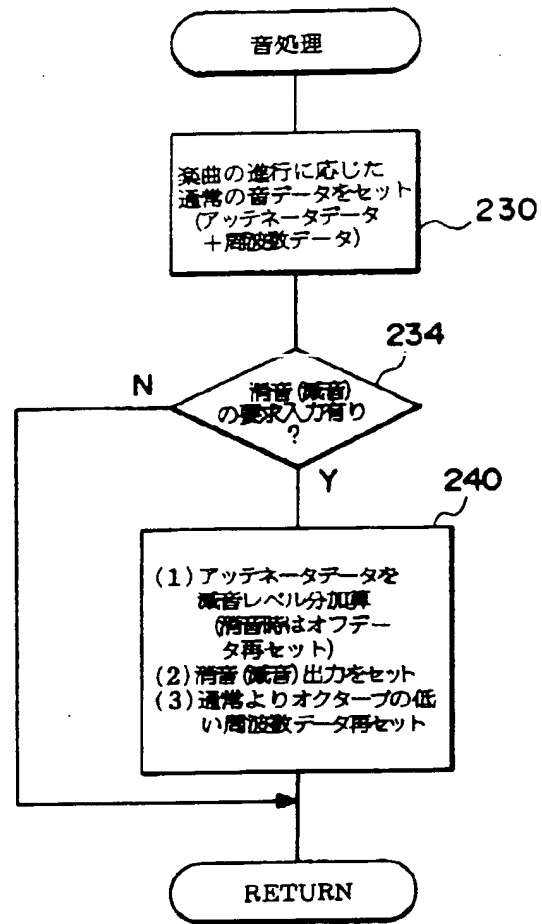
【図10】



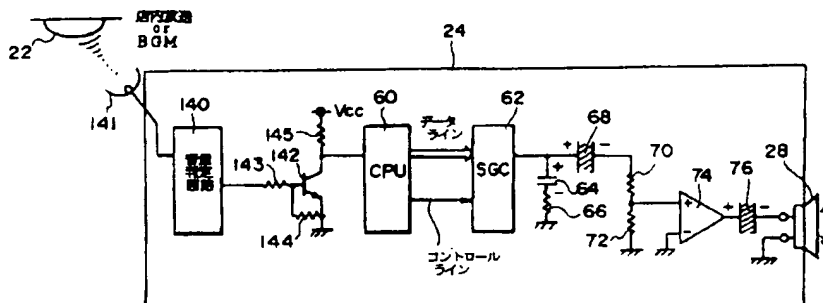
【図11】



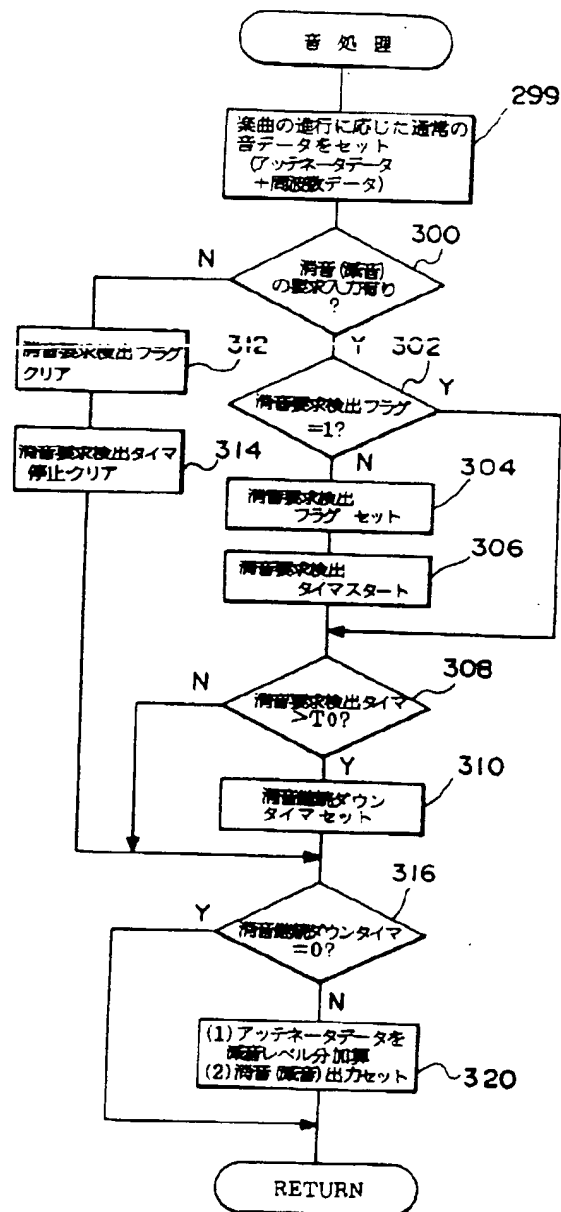
【図12】



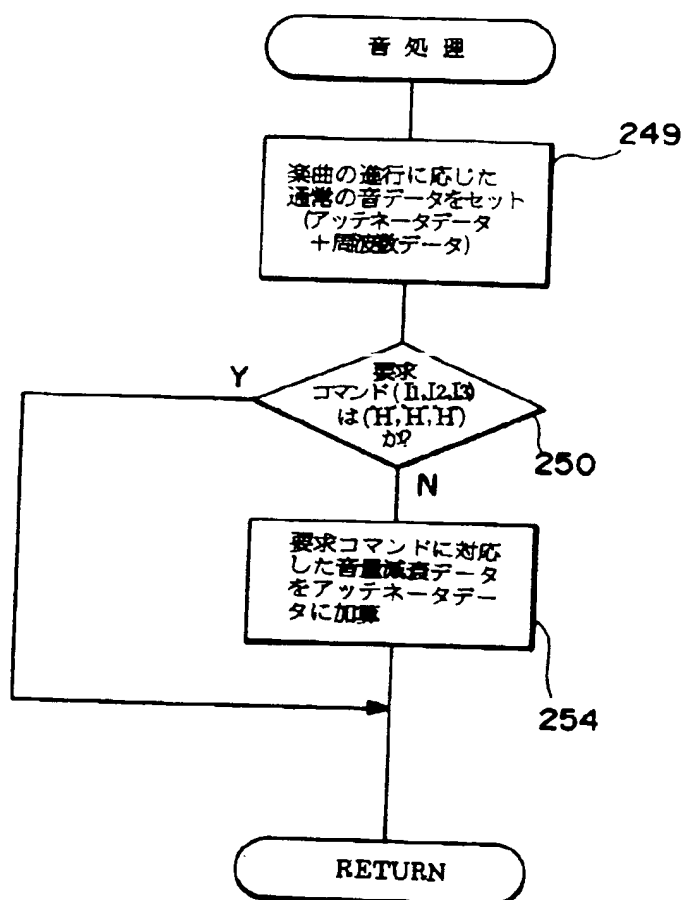
【図20】



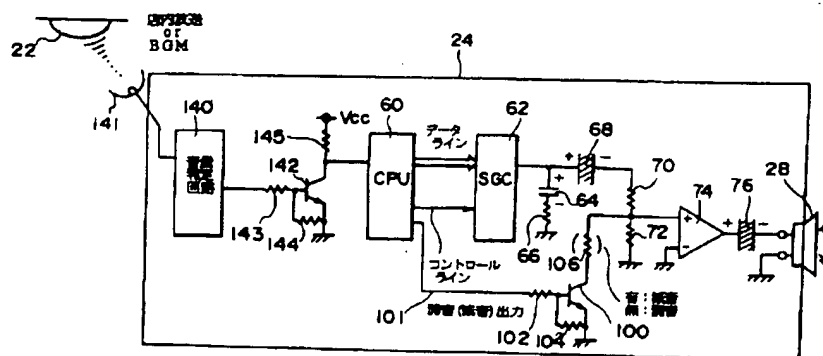
【図13】



【圖 16】



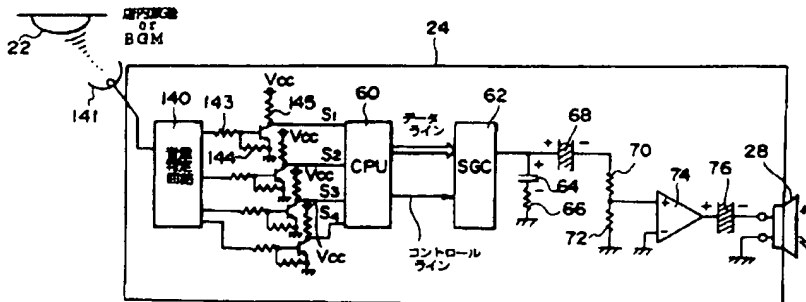
【圖 21】



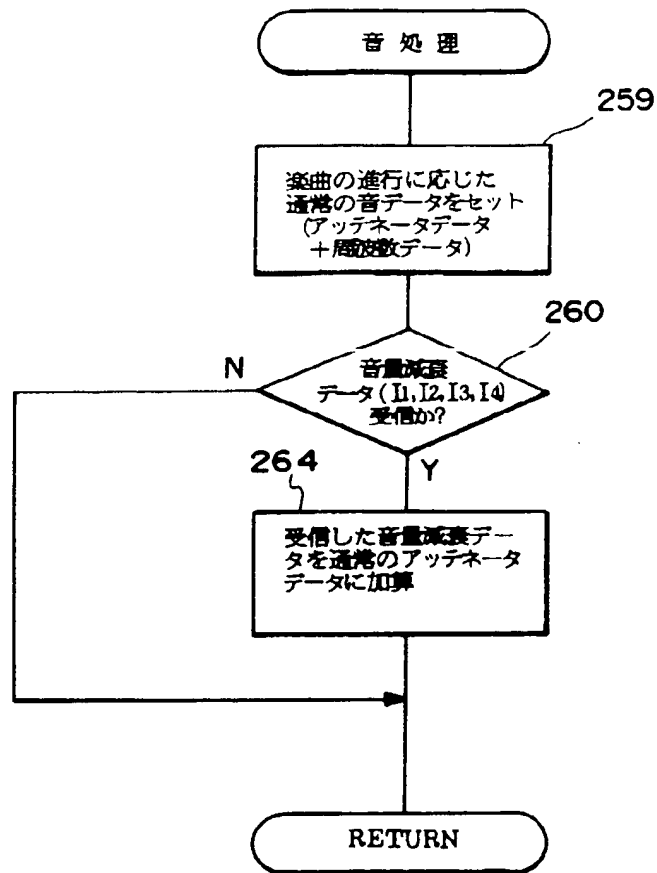
【図17】

I1	I2	I3	音種類	遊技音の 音量減衰レベル	加算する 音量減衰データ
H	H	H	放送なし	0 dB	変更なし 0
H	H	L	遊技音優先BGM	-6 dB	3
H	L	H	BGM優先BGM	-20 dB	10
H	L	L	コマーシャルモード	OFF	15
L	H	H	大当たりスタート報知	-10 dB	5
L	H	L	打止め報知	OFF	15
L	L	H	閉店報知	-24 dB	12

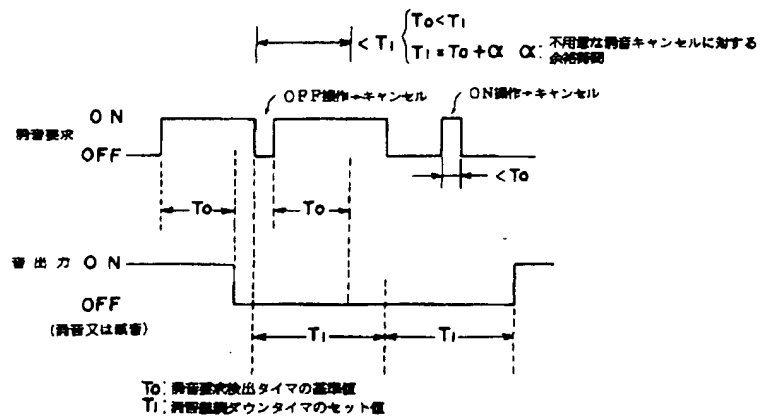
【図22】



【図18】



【図25】



【図19】

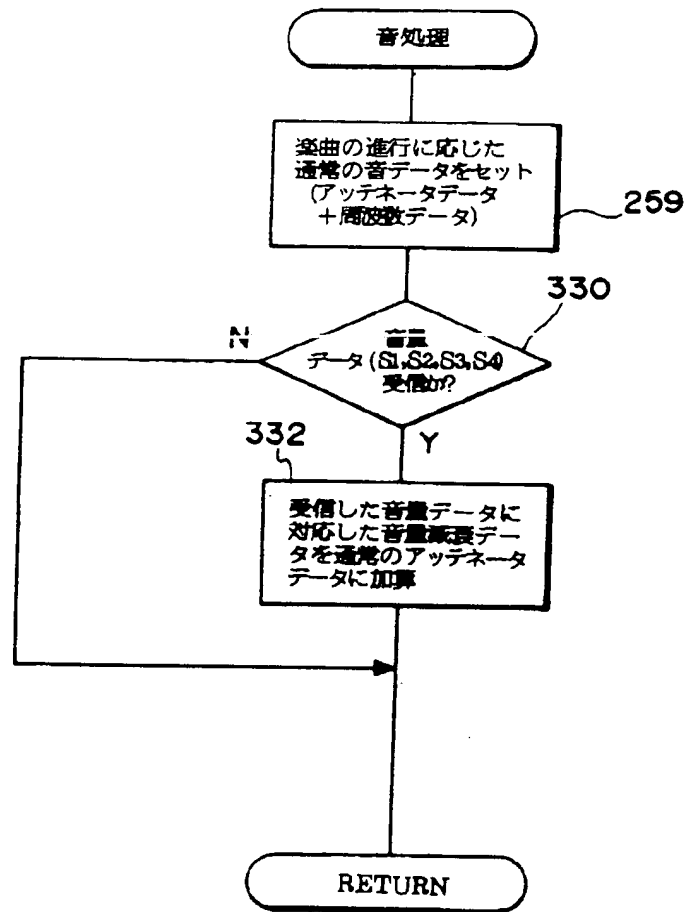
(a)

マイクボリューム設定	I ₄	I ₃	I ₂	I ₁	
OFF	○	○	○	○	遊技音 最大
音量小	○	○	○	┃	↓ 遊技音 小
		⋮			
音量大	┃	┃	┃	○	
MAX	┃	┃	┃	┃	遊技音 最小
					遊技音 OFF (消音)

(b)

マイクボリューム設定	I ₄	I ₃	I ₂	I ₁	
OFF	┃	○	○	○	遊技音 16dB (消音はしない)
音量小	○	┃	┃	┃	↓ 遊技音大
		⋮			
音量大	○	○	○	┃	
MAX	○	○	○	○	遊技音最大

【図23】



【図24】

(a)

音量データ					音量減衰データ				
S ₁	S ₂	S ₃	S ₄		I ₁	I ₂	I ₃	I ₄	
1	1	1	1	(無音)	0	0	0	0	遊技音 最大
1	1	1	0	(音量小)	0	0	0	1	↓ 遊技音 小
⋮							⋮		
							⋮		
0	0	0	1	(音量大)	1	1	1	0	遊技音 最小
0	0	0	0	(MAX)	1	1	1	1	遊技音 OFF (消音)

(b)

音量データ					音量減衰データ				
S ₁	S ₂	S ₃	S ₄		I ₁	I ₂	I ₃	I ₄	
1	1	1	1	(無音)	1	0	0	0	遊技音 16dB (消音はしない)
1	1	1	0	(音量小)	0	1	1	1	↓ 遊技音大
⋮							⋮		
							⋮		
0	0	0	1	(音量大)	0	0	0	1	↓ 遊技音最大
0	0	0	0	(MAX)	0	0	0	0	

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DIALOG(R)File 351:Derwent WPI

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012197106 **Image available**

WPI Acc No: 1999-003212/199901

XRPX Acc No: N99-002600

**Sound control system for pachinko hall with several pachinko machines -
has sound control unit which input noise reduction signal from exterior
into game machine and enables reduction of noise in game machine**

Patent Assignee: HEIWA KK (HEIW-N)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
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JP 10277213	A	19981020	JP 9784168	A	19970402	199901 R
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Priority Applications (No Type Date): JP 9784168 A 19970402

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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JP 10277213	A	31	A63F-007/02		
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Abstract (Basic): JP 10277213 A

The system has a broadcast unit which broadcast the sound information of a game machine (24) installed in a game hall. The broadcast of sound information is done according to certain predetermined conditions. A noise reduction signal is input to the game machine from the exterior by a sound control unit and control of sound in the game machine is performed.

ADVANTAGE - Enables composing of image of entire store. Performs simple sound control. Offers charming view to game visitor.

Dwg. 1/25

Title Terms: SOUND; CONTROL; SYSTEM; HALL; MACHINE; SOUND; CONTROL; UNIT;

INPUT; NOISE; REDUCE; SIGNAL; EXTERIOR; GAME; MACHINE; ENABLE; REDUCE;

NOISE; GAME; MACHINE

Derwent Class: P36

International Patent Class (Main): A63F-007/02

File Segment: EngPI

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